

AN
INVESTIGATION INTO THE VALUE OF
BRONCHOSCOPIC ASPIRATION
IN CASES OF PERSISTENT COUGH IN
CHILDREN.

by

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The investigations which form the subject of this Thesis were undertaken in the Outpatient Department of the Victoria Hospital for Sick Children, Hull, and all the clinical examinations were carried out by the Author.

Reasons for Investigation.

In the outpatient department of this Hospital large numbers of children presented themselves for treatment on account of persistent cough lasting over a longer or shorter period of time. The children who have been investigated had all had some form of outpatient treatment directed towards the cure or alleviation of their cough without any lasting benefit. As medical treatment appeared to be of no avail it was decided to try some other method and bronchoscopic aspiration was carried out.

This work is based on a series of sixty cases of persistent cough in children, and from the previous history an attempt has been made to ascertain the original causes of the cough, and by clinical and radiological examinations I have endeavoured to diagnose the pathological condition in the lungs causing the cough to persist. Bronchoscopic aspiration, and in some cases the instillation of an oily and mildly antiseptic solution was carried out,

and, from the results obtained, an attempt has been made to assess the value of this treatment, and to ascertain the type of the case in which such treatment would prove beneficial.

For the purposes of the investigation only cases are included that show abnormal findings in the lungs by clinical or x-ray examinations.

In this series only cases of chronic non - tubercular infection of the lungs have been included. Pulmonary tuberculosis is a condition which requires special supervision and is not suitable for treatment by bronchoscopic aspiration; this type of case has, therefore, been excluded from the investigation.

In all the cases under review the symptom of cough has been present for a number of months, or even years, and they have all been receiving treatment without apparent benefit. This treatment has been medical. In the majority of the cases some expectorant drug had been given, and an attempt had been made to improve the general health of the child by the administration of cod liver oil with, or without, malt, by vitamine therapy and by the giving of artificial sunlight. In some cases postural coughing had been advised and carried out.

Causes leading to persistent cough.
Analysis of cases.

On going into the history of the cases it is found that in the list of previous illnesses three diseases of the respiratory system bulk very largely as the probable original cause of the cough. Pneumonia, Whooping cough and Measles are the three diseases which are found in constant association with the commencement of the cough. Some of the children have had all three. In the children who have had pneumonia it has been found impossible to determine whether this was alveolar or broncho-pneumonia, as only in a few cases have the notes of the illness been available. Associated with, or causing the cough, in eight cases antral suppuration has been found. A.H.Persky (1) calls attention to sinusitis in children being the direct cause of cough in many cases. C.G.Kerley (2) emphasises the connection between persistent cough and sinus involment and advises an x-ray of the sinuses in every case of unexplained cough in childhood.

In twentysix cases (43.3%) the cough has dated back to pneumonia, in six cases (10%) to measles, and in thirteen cases (21.6%) to whooping cough. Some of the children, seven in number, have had all three

diseases while thirteen children have had pneumonia on more than one occasion. In the ten cases of asthma it was found that only one child had no previous history of respiratory disease, while in the nine others pneumonia, measles or whooping cough had occurred, but these did not seem to have been the starting point of the asthma. In only one case did the mother think the commencement of the asthmatic attacks dated to one of these diseases, namely whooping cough.

The cough reflex.

Halliburton (3) describes the cough reflex as follows :- "In the act of coughing there is first of all a deep inspiration followed by an expiration; but the latter, instead of being easy and uninterrupted, as in normal breathing, is obstructed, the glottis being momentarily closed by the approximation of the vocal cords. The abdominal muscles, then strongly acting, push up the viscera against the diaphragm, and thus make pressure on the air in the lungs until its tension is sufficient to noisily open the vocal cords which oppose its outward passage. In this way considerable force is exercised and mucus and any other matter that may need expulsion from the air passages is quickly and sharply expelled by the

outstreaming current of air."

Gunn (4) draws attention to the various conditions obtaining in the respiratory tract. The trachea and bronchi are lined with ciliated epithelium down to, but excluding, a short length of the bronchioles. A continuous secretion of mucus is necessary for moisture but normally the cilia by their propulsive movement can deal with that.

Halliburton (5) has shown that the movements of the cilia are upwards to the trachea and larynx, and the secretion carried up by these movements irritates the sensitive surface and induces a cough by which the phlegm is expelled from the respiratory passages into the mouth. The expulsive effect of the cough is greatest near the larynx and least in the smaller bronchioles. The smaller bronchioles are not lined by ciliated epithelium, they have a definite muscular coat. (Bullowa -6-) This muscular coat has a peristaltic movement which takes the place of cough and the cilia, in moving the secretion upwards. The motor and secretory mechanism is controlled by the vagus which is the afferent nerve from the mucous membrane and is also the motor nerve to the bronchial muscles and secretory glands. When the mucous membrane is irritated by noxious particles or by too

profuse or viscid a secretion this irritation stimulates the cough centre and there results reflexly either cough, increased secretion or peristaltic movement of the bronchioles, or some combination of these.

Negus (7) reviews the natural defences of the lungs against infection or the entrance of foreign bodies. He draws attention to four factors :-

(a) protective closure of the larynx which does not offer any real safeguard against infection; and he quotes the investigations of Myerson (8) and Hara (9) who found blood in the trachea and bronchi in a large proportion of cases after tonsillectomy.

(b) Cough - is the most important defence, but he considers that it is fallacious to rely on the cough reflex because of its brief duration. Chevalier Jackson (10) states that the sensitiveness of the mucous membrane passes off in a few minutes and no further effort is made to expel the secretion. There is another factor in cough to be considered and that is the inspiratory opening and expiratory contraction which occur during respiration and which become more marked during cough Ingals (11) and Watson Williams (12)

(c) Secretion of mucus is of great importance in preventing infection of the lungs - it is strongly

inhibiting to the growth of organisms (13).

(d) Ciliary action is specially valuable in removing bacteria before they have got a foothold.

Negus (14) states that the main defence of the trachea and bronchi is that provided by cilia. They never cease in their action and they keep the mucous surfaces free from bacteria. In the human being cilia only cover the upper part of the nasopharynx and not the lower. Bacteria are carried part of the way down the nasopharynx by the cilia, but beyond this are removed by swallowing. If the swallowing movements are not efficient bacteria collect and multiply in the nasopharynx. He also points out that cilia can propel objects as rapidly in an upward direction as in a downward. Cilia must have a fluid medium in which to work, they will not work if dry.

Proetz (15) has shown that solid objects are carried along in a blanket of mucus without coming into direct contact with the epithelium. If too much fluid is present this blanket is destroyed and only a churning effect takes place. Such a condition exists if a bronchus is filled with secretion and ciliary action then fails.

Negus (14) shows that in rhinitis and sinusitis the reaction of the epithelial secretions, and

probably of the tissue fluids in the affected area, tend towards the acid side with a decrease in the alkali reserve, and he mentions methods by which this may be overcome to allow ciliary action to work efficiently. These are - firstly - by removing bacteria by aspiration or lavage, - secondly - by giving alkali by the mouth to increase the alkali reserve.

Chevalier Jackson (16) describes the normal physiological mechanism for prevention of stagnation of any excess of secretion in the bronchi, large or small, as consisting of three mechanical factors :-

(1) the squeeze of thoracic compression of the lung in cough,

(2) the cough blast,

(3) ciliary action.

Upon the efficient co-operative activity of these three factors drainage of the human lung depends. The first link to weaken in inflammatory changes is the ciliary one. "Considering the structural delicacy of the cilia it is logical to suppose that violent or long continued inflammatory processes destroy the cilia or impair their activity in the area affected. Then enters another factor to impair ciliary activity - namely obstruction due to inflammatory swelling of the

mucosa , which, as all bronchoscopists have seen, objectively obliterates the smaller bronchi. Still another factor to impair ciliary efficiency appears if the inflammatory process continues, and the already impaired ciliary action is not aided - namely the development of granulations. The subjacent impaired, or even unimpaired, cilia, if such exist, cannot do much in the way of forcing pus through a bronchus whose lumen is completely occluded by granulations. Moreover granulations have no cilia. Hence a granulation creates a gap in the continuity of ciliary effort. This in the bronchi means stagnation and we may say that stagnation is one of the chief factors in the development of pulmonary abscess and bronchiectasis."

"Summarising - it may be stated that in any case of suppurative focus communicating with a bronchus, and in which the surgeon and internist deem external operation not strongly indicated, bronchoscopic aspiration should be used to supplant medical care."

Chevalier Jackson (16) points out that the aetiological factor is infection from the teeth, the tonsils, and the nasal sinuses, and he states that all human beings inspire secretions from the pharynx during sleep. The cough reflex, which he calls "the

watch dog of the lungs" drives out the secretions and with them most of the invading bacteria. The few that remain are wafted out by the cilia or are destroyed by the cells and juices.

In a lecture to the Royal Society of Medicine, Chevalier Jackson (16) states that "Bronchial obstruction is one of the most important aetiological factors in suppurative disease of the lung." When healthy the defensive powers of the lung can deal with bacterial invasion, but when the cough and ciliary action are impaired by diminished ventilation and drainage then the suppurative processes gain the upper hand. His bronchoscopic examinations have convinced him that inflammatory narrowing of a bronchus is the most important cause of pulmonary abscess and other suppurative diseases of the lung. If the bronchial mucosa were not swollen by inflammatory processes the defensive powers of the lung could repel the invaders. If the swelling persists for any length of time it becomes a permanent condition and fibrosis is produced with later cicatricial contraction. He also refers to the bronchoscopic evidence that in cases of suppurative diseases of the lungs the cough reflex is less efficient. This inefficiency of the cough reflex is also commented on by R. Graham Brown in a paper read

before the Royal Society of Medicine (28)

Objects of Bronchoscopic Aspiration and Ancillary Treatment.

Chevalier Jackson (16) postulates that "bronchoscopic aspiration is indicated for treatment (a) to prevent stagnation (b) to restore the defensive powers of the lung especially the ciliary action, and (c) to remove obstruction if present." It is with these objects in view that the bronchoscopic aspiration was carried out on the cases under review.

In his book 'Bronchoscopy, Oesophagoscopy and Gastroscopy' (17) he states that in most cases of bronchiectasis there are strong indications for a bronchoscopic diagnosis. He draws a parallel between bronchiectatic cavities and what sanitary engineers call a septic tank. I quote his own words :-

"Our bronchoscopic observations indicate that (a) the purulent secretions when first produced in chronically inflamed bronchi are very thick and of such great viscosity that they cannot be expelled under existing impaired conditions of expulsion; (b) nature's way of aiding expulsion is by the breaking up of the viscid secretions into more fluid and easily expelled secretions; (c) this change in the character of the secretions is brought about by

bacterial activities, chiefly saprophytic, but other agencies may contribute; (d) the products and by-products of these changes are intensely irritating to the bronchial walls and are one of the factors in the changes in those walls as in the perpetuation of the disease. Though this use of the tracheobronchial tree as a septic tank for alteration of the character of the contents may enable the individual ultimately to get rid of the pus by lessening its viscosity, the resultant structural changes in the bronchial walls and especially the destruction of the cilia constitute an awful price to pay for riddance of pus. As in the case of nature's amputations there is room for great improvement in remedial processes. By way of contrast it may be parenthetically stated here that by bronchoscopic aspiration we get up this freshly generated thick pus of high viscosity without waiting for it to get a lower degree of viscosity by rotting. Bronchoscopic aspiration thus becomes a prophylactic of bronchiectasis. We may say then that one of the results of bronchoscopic studies has been to demonstrate the existence of the bronchiectatic septic tank and one of the achievements of bronchoscopic aspiration has been to eliminate it."

He also advises bronchoscopy in cases of asthma

and he finds that tenacious mucus was aspirated from many of these cases. In many cases a complete cure resulted while in others little or no influence on the recurrence of the attacks was observed. He warns the bronchoscopist not to mislead himself into thinking that asthma is always a local disease and holds that the best results follow bronchoscopic aspiration as an adjuvant to general treatment.

Thomas Macrae (18) has said "bronchoscopy is of value used early; but early must be stressed. This means early diagnosis, which is very rarely made. We may be able to prevent advanced bronchiectasis by early recognition and prompt bronchoscopic treatment."

G. Ewart Martin (19) also reviews the treatment of bronchiectasis and other chronic non-tubercular diseases of the chest by bronchoscopy, and puts in a plea for bronchoscopy as a means of treatment where ventilation and drainage of the lung is at fault.

In addition to bronchoscopic aspiration the cases under treatment were all given sodium bicarbonate by mouth. This is given for two reasons, firstly to increase the alkali reserve in the blood and secondly to make the secretion in the bronchi less viscid. In some cases the children had been having some form of sedative given and this was stopped as it tends to

damp down the cough reflex - what Chevalier Jackson calls "drugging the watch dog of the lungs to sleep."

In many of the cases an attempt to improve the general condition by exposure to artificial sunlight was made as an addition to the bronchoscopic and drug treatment. In the children who were rather thin and showed evidence of malnutrition some preparation of cod liver oil, with or without malt, was administered.

In many of the cases where the secretion was tenacious and difficult to remove by suction gomenoleo was introduced through the bronchoscope. This assists in making the secretion less viscid and easier to remove by suction, and by its antiseptic action tends to inhibit the rapid growth of bacteria.

Moore W.F. (20) studied twenty-seven cases of asthma bronchoscopically and they were found to fall into two groups - (a) those with bronchoscopically evident suppurative tracheo bronchitis; (b) those with evident chronic passive congestion. In the first group infection seemed to be responsible for the condition, and in the second factors outside the bronchi.

G.R.Morfitt (21) has studied the ciliary movement in asthma. The following changes were

noted (1) loss of the ciliary movement which produces a current (2) complete loss of ciliary movement, (3) actual loss of the cilia, (4) fatty degeneration of the cell. His observations lead him to believe that replacement of cilia or ciliated cells, lost by disease, can take place.

Ramirez & St. George (22) treated a series of cases of asthma bronchoscopically. Mucus was aspirated and adherent mucous was removed by sponging. They prepared vaccines from secretion from the right and left bronchi. They also used local applications to the bronchi - the application of 10% silver nitrate or the instillation of lipiodol or menthol and camphor in cod liver oil. All the patients received vaccines or injections of an offending protein. The specific allergic cases associated with bronchitis were benefited but not cured. The non-allergic cases were much benefited. They consider that bronchoscopy is of decided value in non-allergic cases with bronchitis - partly because of the benefit derived from the removal of adherent mucus and local applications, but also because vaccines made from chief bronchial cultures were more effective than those made from the sputum.

In this small series of cases cultures were not taken from the bronchi as the scope of this work was limited to the investigation of the value of bronchoscopy in cases of persistent cough from all causes. The instillation of gomenoleo was carried out in two of the cases.

Mainzer (23) uses bronchoscopic aspiration in the treatment of bronchiectasis at weekly intervals until there is a complete relief of symptoms. He instils into the bronchi an oily solution containing monochlorophenol and camphor. He also prescribed ammonium chloride to thin the secretion.

Because of the opinions of these authorities it was decided to treat the cases of persistent cough by bronchoscopic aspiration. In the advanced cases of bronchiectasis it was realised that the treatment would only be palliative, but it would prevent the children from becoming more toxic from the retained pus in the cavities, and make them more comfortable. In the other cases it was hoped that by early treatment and the removal of secretion, damage to the bronchi and lungs would be prevented and ciliary action restored. The treatment of the asthmatic cases was rather an experiment - although Chevalier Jackson (16) and Martin (19) both consider it worth trying.

Method undertaken.

All the bronchoscopic aspirations were done by Mr. R. R. Simpson, F.R.C.S., E. at my request, and I was present at all treatments.

In the earlier stage of the investigation general anaesthesia was given as a routine. In Chevalier Jackson's clinic bronchoscopy is performed without anaesthesia - but in the absence of a specially trained team of assistants it was deemed advisable to anaesthetise the children. In the later stages inhalation anaesthesia was replaced in a good many cases, especially in the older children, by the intravenous injection of sodium evipan administered by the method described by Jarman (24)

In all cases this proved a most satisfactory method and practically no difficulties were encountered. In one or two cases there was slight cyanosis after the bronchoscope had been withdrawn but these cleared up very quickly on the administration of carbon-dioxide and oxygen. In a few of the smaller children, in place of general anaesthesia, paraldehyde given per rectum was tried and this also proved very satisfactory. The method used in the administration of paraldehyde per rectum was as follows :-

Thirty-six hours before bronchoscopy an aperient was given, about fifteen hours before, a rectal wash-out was given, and one hour before, paraldehyde, one drachm in one and a half ounces of cold normal saline for each stone of weight was administered slowly, taking about ten minutes to give each ounce. As soon as the bronchoscopic aspiration was finished a rectal wash-out was given.

The laryngoscope was first passed and a direct view of the larynx was obtained. The bronchoscope was then passed down through the laryngoscope into the trachea. The laryngoscope was then removed and a prop or gag placed between the teeth. If secretion were present in the trachea this was removed by suction through an aspirating tube attached to an electrically operated suction apparatus. The main bronchi were then inspected and secretion removed from them by the same method. The openings of the upper and middle lobe bronchi were identified and the presence, or otherwise, of secretion or mucus noted, and finally the bronchoscope was passed down into the lower lobe bronchi. Where definite cavities existed - as in the case of lung abscess and in the case of advanced bronchiectasis - the cavity

was sucked as dry as possible. In cases where it was considered advisable gomenoleo was injected directly through the lumen of the bronchoscope by means of a piece of rubber tubing attached to a 5 cc. syringe - care being taken to inject at the moment of inspiration.

General Remarks on Cases Investigated.

In this series of sixty cases boys appeared to be more frequently affected than girls. The numbers were thirty-three boys (55%) and twenty-seven girls (45%).

This is in accordance with Young's views in his lecture on chronic non-tubercular infection of the lungs in children (25).

All the children investigated were under twelve years of age - the oldest children being just twelve, whilst the youngest was three years old.

As the children were all attending the outpatient department of a hospital it will be readily understood that, as a rule, they belonged to the poorer section of the population. The majority of them were from very poor homes and the impression one got was that, while they all appeared to have a sufficient diet, they were not looked after at home as well as one could wish. It seems most probable, also, that in their

original illness, pneumonia, measles or whooping cough, they did not have the prolonged nursing and treatment necessary to give them a good chance of recovery.

Their convalescence, also, was unlikely to be very complete. This point is also emphasised by Young (25) in his lecture and he gives this as a reason why chronic infection of the lungs is more likely to occur in the poorer class children. He, therefore, stresses the importance of adequate convalescence after respiratory diseases.

The question of clothing was also investigated and it was generally found that, in the winter at least, the children were grossly overclad - the thick layers of woollen garments interfering with the respiratory movements of the chest.

Young (25) quotes figures by Leys with regard to family history. Leys states that 23% of parents give a history that father or mother had chronic cough or chronic bronchitis and in 26% other children of the family suffer from a similar condition.

P. Watson Williams (26) discusses the familial infection of chronic sinusitis and suggests that a child with sinus infection will tend to infect brothers or sisters and if that child grows up and marries is prone to infect members of his or her family.

In the cases investigated an attempt was made, in the first instance, to trace any family history of chronic cough, chronic bronchitis, or sinus infection, but as it was almost impossible to get reliable data this was abandoned.

In an Editorial article published in the Lancet (27) the question of infectivity in families is emphasised. - "Chronic pulmonary catarrhs are communicable diseases and, though the infectivity may be low, in squalid areas several members of the same family may be infected with bronchiectasis. Overcrowding and bad housing probably play a greater part in the dissemination of these diseases than they do in pulmonary tuberculosis."

Most of the children looked healthy and well-developed but on examining more closely it was found that they were not really well-developed but only flabby. R. Graham Brown in his communication to the section of Laryngology, Royal Society of Medicine in May 1928, "Bronchiectasis in Children: the pseudo robust appearances associated with nasal accessory sinus suppuration" (28) draws attention to the fact that although these children looked well they were not really so, and points out that there is a typical

facies in cases of bronchiectasis with antral suppuration. They show well developed, broad faces, which he attributes to the large size of the antral cavities, and, consequently, of the upper jaws. He holds the view that pus in the antra of young children expands the upper jaws to a greater degree than does air in its normal passage through the nostrils and air sinuses. He, therefore, advocates x-ray examination of the sinuses and of the chest in children who have a loose rattling cough and a facies of this type.

A very common symptom in addition to the persistent cough was that the children became easily tired. This symptom was given voluntarily by the mothers and not elicited by questioning. In fairly frequent association with this was dyspnoea on exertion.

It was rather surprising to find how seldom clubbing of the fingers was present, considering the fact that many of these children had had persistent cough for a number of years. In only two cases - the two showing advanced bronchiectasis with cavitation in the lungs (cases 45 & 46) was the condition present.

In a few of the cases arrangements were made for the children to attend the open air school in the City. There seems to be no doubt that living, and being taught, in the open air has a very definite beneficial

effect upon the general health of the children.

General Analysis of Cases Investigated.

For the purposes of analysis the cases have been divided into groups :-

Group A. Eight in number, comprises these cases where abnormal clinical signs were present in the lungs, and where the x-ray appearances of the chest were normal.

Group B. Comprises the cases where the lungs showed abnormal clinical signs and in addition the x-ray examination revealed some abnormality.

Group B. is further subdivided into :-

(1) those cases in which sinus infection was associated, eight in number, and

(2) those which showed no sinus condition, thirty four in number.

Group C. contains the ten cases of asthma.

Group A. This group represents 13.3% of the series. The clinical signs in these cases varied somewhat. In four cases (Nos. 1, 4, 6 & 7) there was impaired percussion note at the left base. In two cases (Nos. 3 & 5) the note was impaired at the right base, while in two cases (Nos. 2 & 8) no alteration in percussion was found. Rhonchi and crepitations were found in all

cases - the crepitations being invariably at the base of the lungs. In cases Nos. 2 & 8, although there was no alteration of the percussion note, the crepitations in both cases were heard at the left base.

This finding corresponds with that of Young (25) who states that the left base appears to be more frequently affected than the right.

The radiological examination of the chest in all the cases in this group showed no abnormality.

On bronchoscopic examination tenacious muco pus was aspirated from the bronchi in all the cases, and the bronchi appeared normal except in case 6, where, on aspiration of muco pus from the left lower lobe bronchus, the bronchus was found to be collapsed. In every case the adventitious sounds disappeared after bronchoscopic aspiration. In addition all the children showed definite improvement in their general health.

Of the eight cases treated, four showed a definite increase in weight during the treatment while four showed a slight increase.

Group B.1. comprises the cases of persistent cough associated with sinus conditions. This group contains eight cases which represents 13.3% of the total number investigated.

The association of sinus infection with chest diseases is now well recognised and numerous writers have called attention to this association. The question of the spread of infection from the sinuses to the respiratory tract has been the subject of much investigation and there are four methods of spread recognised. In a review of the interrelationship of paranasal sinus disease and certain chest conditions McLaurin (29) enumerates "the probable routes by which infection reaches the chest from the diseased sinuses as follows :-

(1) direct aspiration of infecti^{ve}~~ous~~ material into the trachea and bronchial tree - the so-called aspiration or droplet infection.

(2) Lympho haematogenous extension

(3) haematogenous extension, and

(4) direct continuity of tissue."

He believes that the association of bilateral bronchiectasis and paranasal sinus disease is almost constant. He states that the best treatment for bronchiectasis is prevention, which means that sinus disease must be recognised early in life and unrelenting efforts made to control it. He also holds that no improvement in the chest condition will take place until the sinus disease is cleared up.

Smith (30) emphasises the importance of obtaining a thorough history of cases of chronic bronchial suppuration. He is of the opinion that it will be frequently found that a specific fever was responsible for both the nasal sinus and bronchial suppuration.

Chevalier Jackson (16) also stresses the importance of infection of the nasal sinuses in bronchiectasis. He states that if the patient has an incurable focus in the sinuses it is useless to expect more than palliation of the secondary suppuration in the bronchi.

In this group four of the cases (Nos. 10, 11, 12 & 13) showed x-ray evidence of bronchiectasis - in all at the left base. One of these four cases (No. 13) showed the triangular shadow of atelectatic bronchiectasis. In two cases (Nos. 14 & 16) increased striation was shown at the bases - in one case (No. 9) an old diaphragmatic pleurisy and root fibrosis was found. In only one case (No. 15) was the x-ray appearance of the chest normal. In none of the cases were symptoms complained of referable to the sinuses, the antra being found opaque on routine x-ray examination. There was, therefore, no definite indication as to how long antral suppuration had been present. Five of the children (Nos. 11, 14, 15 & 16) gave a history of having had measles and one might

presume that the antrum had become infected during the course of this disease.

Case No. 9 had a history of winter cough for several years - case no. 13 gave a history of pneumonia for the past two winters, and the liability to get colds easily, while the cough in case No. 12 dated from whooping cough. The treatment in each case was preliminary antral lavage, followed by antrostomy by the nasal route, in two of the cases, where the pus was very thick and difficult to remove by lavage.

Bronchoscopic aspiration revealed the presence of pus in both main bronchi and in the right lower lobe bronchi in case No. 9. A large quantity of pus was aspirated from both lower lobe bronchi in case No. 11. although the x-ray showed bronchiectasis at the left base only. In four cases (Nos. 10, 12, 15 & 16) muco pus was aspirated from both main bronchi. In case No. 13 muco pus was aspirated from the left lower lobe bronchus, and in case No. 14 the main bronchi were found to be clear on bronchoscopic examination.

The results of bronchoscopic aspiration in this group was uniformly good, though there is no doubt that the treatment of the sinus infection assisted.

In all cases, with the exception of No. 9 the general condition of the child improved greatly and

the cough was markedly diminished, and in some cases completely cured. Four of the cases showed a definite increase in weight during treatment, and four showed a slight increase. In none of the cases in this group was there any loss in weight, and in none did the weight remain stationery.

The abnormal physical signs completely disappeared in cases Nos. 11, 12 & 14. In cases Nos. 10, 13 & 15 there was an improvement in the physical examination of the chest and the adventitious sounds had disappeared. In case No. 16 only one bronchoscopic treatment had been carried out and the condition had not improved. The child is still attending and it is expected that after further treatment the lung signs will clear up. Case No. 9 is the only case in this group which has proved somewhat disappointing. The cough in this case has been present for seven or eight years and the chest showed a deformity which is associated with long standing respiratory disease. It was not to be expected, therefore, that marked improvement would take place.

Group B.2. These cases which showed abnormal findings on both clinical and radiological examination, but without sinus infection, is the largest group in the series investigated. The cases in this group

number thirty four which represents 56.6% of the total. For the purpose of analysis the group has been subdivided in accordance with the x-ray appearances into nine cases which show increased root shadows - ten cases which reveal increased striation - eleven cases of bronchiectasis, of which three show the typical triangular shadow of atelectatic bronchiectasis, - one case of lung abscess following tonsillectomy, - two cases of unresolved pneumonia - and one case of collapse of the right lower lobe.

On going into the previous history of the nine cases which show increased root shadow, with one exception (case No. 25) all the children had had pneumonia complicated in one case (No. 18) by empyema. The increase in the hilar shadow and in some cases increased striation running down towards one or other base are evidence of lung fibrosis.

As lung fibrosis is uncommon after uncomplicated lobar pneumonia it is most probable that in all these children the original illness was broncho-pneumonia. Davidson (31) states that the distribution of fibrous tissue in the lungs varies according to the situation of the responsible irritant. There may be thickening of the hilum, with overgrowth of connective tissue spreading peripherally along the bronchi and blood

vessels or inwards from the pleura.

Of the nine cases which show, on x-ray examination, increase of the root shadows, in four cases (Nos.18,22,24 & 25) dullness over the root posteriorly was elicited on clinical examination, in four cases (Nos.17,20,21 & 23) slight dullness was present at the base, while in the remaining case (No.19) no dullness was found. In five cases (Nos.21,22,23,24, & 25) the air entry at one or other base was poor, in three cases (Nos.17,19 & 20) the breath sounds were harsh in character at the affected base, and in one case the breath sounds were harsh all over both lungs. In three cases (Nos.17, 19 & 22) crepitations were heard at the base, in three cases (Nos.18,21 & 23) rhonchi were present and in three cases (Nos.20,24 & 25) no accompaniments were heard. The abnormal physical signs were present on the right side in seven cases (Nos.17,18,20,21,22,24 & 25) while in the two others (Nos.19 & 23) the left was the side affected.

In the previous illnesses in the ten cases which show increased striation on radiological examination, four have a history of having had pneumonia - two have had frequent attacks of bronchitis, and two have had whooping cough - one has had measles, and only one gave no history of previous respiratory trouble.

Of these ten cases which show increased striation, eight (Nos. 26, 27, 28, 29, 30, 33, 34 & 35), show this appearance in the left lung, one (No. 32) in the right lower lobe, and one (No. 31) at both bases.

Dullness on percussion was present in six cases (Nos. 27, 29, 30, 31, 33 & 35), the breath sounds were harsh in four cases (Nos. 27, 28, 33 & 35), and the air entry at the base was poor in two cases (Nos. 30 & 32), crepitations were heard in five cases (Nos. 27, 29, 31, 33 & 35), and in four cases (Nos. 26, 28, 30 & 34) rhonchi were present, while in one (No. 32) no accompaniments were heard.

In these cases, also, the condition must be that of pulmonary fibrosis. Riviere (32) in a review of thirty-three cases found that broncho-pneumonia stands out as the common causation of lung damage. Bronchitis either alone or associated with whooping cough, is the next commonest cause.

Such cases are extremely liable to further attacks of pulmonary catarrh and Kitcat & Sellors (33) place under the designation of pulmonary fibrosis the following conditions - fibroid induration, chronic broncho-pneumonia, chronic basal pulmonary catarrh and early bronchiectasis - which they believe all indicate phases of the same condition. They also hold that broncho-pneumonia invariably produces some degree of

bronchiolar dilatation which in itself is a cause of the cough which tends to increase the weakness of the tubular walls. These nineteen cases, therefore, seem to be placed in the category of precursors of bronchiectasis.

Davidson & Pearson (57) consider that it is more satisfactory to regard the evolutionary process in three main aspects. In the first there is the picture of pure chronic bronchitis - in the second the fully developed bronchiectasis - and the third is the intermediate stage. In the latter category are to be found the cases which provide the problems in differential diagnosis. Group A., therefore, will fall into the first category - the eleven cases of bronchiectasis in Group B.2. into the second category, and the nineteen cases (Nos. 17 to 35) into the third.

Following aspiration, of the nineteen cases, seventeen showed very definite improvement in their general health and diminution or disappearance of the cough, while only two (No. 18 and No. 30) showed only very slight improvement and persistence of the cough.

Of the nineteen cases, fourteen showed a definite gain in weight,; two a slight gain while three remained stationery (Nos. 18, 24 & 32).

On clinical examination after treatment ten of the

cases revealed no abnormal physical signs. In one case (No.24) the only abnormal sign on physical examination was diminished air entry at the right base. In the eight others abnormal signs still persisted in the lungs, but these signs were not so severe or so extensive as they had been before treatment.

In group B.2. there are eleven cases of bronchiectasis, six of which showed signs of early bronchiectasis - three showed the triangular shadow of atelectatic bronchiectasis, and two showed advanced bronchiectasis with cavity formation and displacement of the heart.

In the six cases of early bronchiectasis the clinical signs and the x-ray evidence pointed, in every case, to the right base being the affected area. In four (Nos. 36, 38, 39 & 40) there was a history of pneumonia, while one (No. 41) had had measles and whooping cough, - the other (No. 37) measles only. In only two cases (Nos. 37 & 39) was the percussion note impaired. In two cases (Nos. 36 & 37) the breath sounds at the right base were harsh with prolongation of the expiratory phase. In one (No. 38) the breath sounds were high pitched almost tubular in character - in one (No. 39) the air entry at the base was diminished while in the remaining two (Nos. 40 & 41) the breath sounds were normal. Rhonchi and

crepitations were heard in all cases.

Bronchoscopy in these cases revealed the presence of tenacious muco pus in the lower lobe bronchi, with the exception of case No. 36 where thick yellow pus was aspirated from the right main bronchus. In all the cases there has been a very definite improvement in the general health and in the frequency of the cough. The abnormal physical signs also disappeared except in the cases No. 37 & No. 38, where there was still some slight variation from normal in the breath sounds. In all the adventitious sounds had disappeared.

With one exception (No. 41)' whose weight remained stationery, all the five cases had a definite gain in weight during treatment.

Three cases (Nos. 42, 43 & 44) showed a triangular shadow at the base. One on the right side and two on the left. All three children gave a previous history of pneumonia, while in addition one child (No. 42) had had measles and another (No. 44) whooping cough. Constitutional disturbances in all the cases has been very slight and the children are all well developed and look healthy, though the complexion is somewhat sallow. In all the cases the percussion note was impaired over the affected area - the breath sounds

were altered, being either high pitched in character or having a prolonged expiratory phase. The constant sign was the presence of crepitations at the affected base.

Numerous articles have been written regarding the condition. The earlier writers considered that this shadow was due to a mediastinal effusion, but consistently negative results on needling led to the opinion that only rarely could effusion be responsible. Rist, Jacob and Soulas (35) and Rist, Jacob and Trocme' (36) recognised the presence of bronchiectasis in the cases they described and considered that the shadow was due to a secondary adhesive mediastinal pleurisy over the bronchiectatic area with pneumonic infiltration in it. Cases have been reported in this Country by Morlock & Pinchin (37), Sparks (38), Ellis (39), Rodgers (40), and Findlay (41). In one postmortem specimen Ellis (42) found that the whole of the left lower lobe was involved and that the left upper lobe had expanded to fill the remainder of the left chest. Pinchin & Morlock (37) report four cases - three on the left side all demonstrated as bronchiectasis. Their opinion is that the clearing up of a collapsed area is dependent on free mobility of the chest and diaphragm and this occurs least readily in these parts

where there is a deficiency of movement. This condition obtains particularly at the bases of the lungs nearest to the mediastinum as it is shielded from the more forcible respiratory movements.

Findlay (41) discusses the diagnosis of the "triangular shadow" and stresses the re-inflatability of the lung as essential for a diagnosis of pulmonary collapse. He quotes one case in which this shadow disappeared after inhalation of carbon-di-oxide and oxygen. He supports the view that the bronchiectasis accompanying pulmonary collapse is compensatory in nature.

In case No. 42. x-rays taken, after bronchoscopic aspiration had been carried out five times, showed that the opacity had diminished in size. In case No. 43. after two treatments the physical signs remained stationery. In case No. 44. after three treatments the x-ray appearances remained the same, the dullness and harsh breath sounds were still present but there were no adventitious sounds. In all three cases the general condition was markedly improved, and the cough had practically gone. In addition there was a definite increase in weight in all three cases.

Two cases of advanced bronchiectasis (Nos. 45 & 46) were submitted to bronchoscopic aspiration. In both

these cases the condition had been present for a number of years, in one case for seven and in the other for two and a half. Each dated the commencement of the disease from pneumonia and as both children were under three at the time of this illness it must be presumed that the disease was broncho-pneumonia. In both cases there was clinical evidence of cavitation in the left lung and the heart in each case was displaced to the left. Thick tenacious pus was aspirated at each bronchoscopy. The treatment in one case (No. 46) appeared to upset the child and she was feverish for several days after. The mother refused further treatment so it was impossible to gauge the results. In the other one (No. 45) there was no doubt that the treatment made the boy more comfortable - it lessened the amount of the sputum - it diminished the frequency of the cough and it improved the general condition. During the treatment the boy gained five pounds in weight. It was rather surprising to find any gain in a child with such advanced bronchiectasis, especially as he is very undersized for his age.

While one cannot hope to cure such cases it is likely that amelioration of the symptoms will occur after bronchoscopic aspiration.

In Group B.2. are also included two cases in which the clinical signs were dullness on percussion and diminished breath sounds at the right base. The x-ray picture showed consolidation of the lower base. These physical signs remained present in one case (No. 47) for a month and in the other (No. 48) for two months. This latter case ran an irregular temperature for twelve days and the diagnosis of broncho-pneumonia was made. The other case had no temperature but as the cough had been worse for two months prior to the first examination it is possible that he may have been running a temperature during that time. The question of the diagnosis in these two cases presents difficulties. Bronchoscopic examination in both cases revealed the presence of granulations in the right main bronchus and muco pus was aspirated from beyond. Both cases cleared up completely, as a result of the treatment, in about nine months, and the abnormal physical signs had disappeared. In both cases there was a gain in weight during treatment. It is most probable that these two children are cases of unresolved or chronic broncho-pneumonia.

In one case (No.49) the x-ray revealed collapse of the lower lobe of the right lung. The clinical signs were dullness on percussion, diminished breath

sounds, and numerous moist sounds at the right base. Bronchoscopy revealed collapse of the right lower lobe bronchus and bleeding granulations at entrance to bronchus. This^{etc} was a history of pneumonia at seven months old and frequent attacks of "chest trouble" since. One must presume that there was permanent damage to the lung following the pneumonia - which was almost certainly broncho-pneumonia - and that the damaged lung remained subject to frequent recurrent infections. The collapse is brought about by inflammatory products blocking the bronchus and preventing aeration of the lung beyond. The condition, as shown by clinical and x-ray examinations, cleared up after treatment by bronchoscopic aspiration and, except that there were still diminished breath sounds at the right base at the last examination, no abnormal physical signs were detected. During the treatment there was a definite gain in weight, and the cough was much improved.

In one case (No. 50) lung abscess following tonsillectomy was treated by bronchoscopic aspiration. The symptoms of cough and evening temperature commenced three weeks after tonsillectomy. It is not proposed to discuss the method of infection in this case, nor to try to determine which of the three theories as to

the cause - the aspiratory - the embolic - or the lymphatic spread - is the correct one in this case. Lung abscess following tonsillectomy is a well recognised condition, although it does not appear to have such a high incidence in this Country as in America (Maxwell 55).

On going through the figures at the Victoria Hospital for Sick Children, Hull, it was found that from January 1928 to June 1935, during which time the removal of tonsils and adenoids has been performed by a specialist in Ear and Throat work, only one case of lung abscess following tonsillectomy has been discovered out of 13,190 cases operated on. The operation there is done under gas anaesthesia, with patient in the Rose position. As soon as the adenoids have been curetted the patient is turned over and the face sponged with cold water to stimulate the cough reflex. The short anaesthesia and the position of the patient prevent fragments of adenoid tissue or blood being inspired into the larynx and trachea.

In this case bronchoscopic examination revealed the presence of granulations shutting off the abscess cavity from the right main bronchus. The bronchoscope was passed into the abscess and a large quantity of foul pus was aspirated. Bronchoscopic aspiration was

continued at intervals for a period of about seven weeks and at the end of this time the abscess was smaller and much cleaner. Six months later she returned complaining of cough and some expectoration following an attack of influenza. A few crepitations were heard over the site of the abscess but bronchoscopic examination revealed that the cavity was very small and no pus was present. The improvement was gradual but finally the abscess has been cured. The cough has disappeared and there has been a gain in weight of five pounds during the time the child has been under observation.

The treatment of lung abscess by aspiration is advocated by Chevalier Jackson (17) and he stresses the importance of early bronchoscopy in cases where cough and expectoration start after tonsillectomy. In a series of two hundred and twenty-four patients with pulmonary abscess following operation on the tonsil and upper air passages 61% were well and symptom free - 13% were unquestionably improved - 11% were worse or unimproved, 11% were referred to the surgeon and 4% died. (Jackson -16-). Negus (7) says "bronchoscopy should not be held in reserve: its early use may be the means of avoiding a long illness or of saving the patient's life."

Davidson (43) is of the opinion that, in view of the undoubted benefit to some cases, the use of bronchoscopy as an aid to spontaneous drainage should be given an early trial, though he feels that it is, in actual practice, disappointing. Morlock (44) holds that in lung abscess the essential is free drainage, and if there is partial obstruction bronchoscopic aspiration should be employed. The earlier the bronchoscopic treatment was instituted the fewer bronchoscopies would be required. Pinchin & Morlock (45) state that by bronchoscopic treatment a high proportion of satisfactory results can be obtained in acute cases, and excellent results in chronic cases. Bloch & Soulas (46) stress the necessity for early treatment in acute cases and conclude that the recovery rate is considerably increased by bronchoscopy.

Other writers are not so enthusiastic and consider the results disappointing. Miller (47) reviews one hundred cases. He states that fifty-nine of his cases were arrested or improved, but does not claim actual cures as the result of treatment. Tudor Edwards (48) is doubtful of the value of bronchoscopy alone and Connors (49) states that as a rule bronchoscopy is not successful. Price Thomas (50)

states that:- "bronchoscopic aspiration is of value in those cases which can be cured by bronchial drainage although their number is small, but in the large majority it seldom leads to cure." He agrees that the procedure does definitely decrease the toxæmia, and that the sputum loses a great deal of its offensiveness and its quantity may diminish.

Group C. comprises the cases of asthma (16.6% of the series). Asthma is generally understood to indicate a condition in which the patient suffers from attacks of dyspnoea due to constriction of the smaller branches of the bronchi due to spasm of the unstriated muscle of the bronchioles. It may be an accompaniment of bronchitis or it may occur independently in a patient who is not a subject of that disease. Asthma belongs to the group of allergic diseases where there is a condition of hypersensitiveness of the individual, and much work has been done in the endeavour to trace the particular allergens in asthmatic individuals. In addition to the hypersensitiveness of the person there are certain immediate precipitating causes. The nose and throat and the alimentary tract are frequently the source of the trouble, but of the utmost importance in the adult is the psychological factor. It will be realised,

therefore, that the investigation of a case of asthma presents many difficulties. Asthma may occur at any age, but begins most frequently in the first ten years of life and is common in quite young children. In the cases under review all the children were under 8 years of age when asthma commenced and in four cases the mother gave the history that it had commenced before the child was six months old. Males are generally found to be more liable than females, the proportion, according to most authorities, being two to one. In this small series there were eight boys and two girls. The hereditary factor has been noted by all writers, and Bray (51) finds a hereditary tendency in 50 to 70 per cent.

Bray (52) has published his observations on two hundred cases of asthma. He finds that about one third of the cases have their onset during the first ten years of life. In these cases arising in the first decade, no less than a quarter arise in the first year of life.

He found that boys were affected three times as often as girls. He also found a family history of allergy in seventy per cent of cases of asthma in children. He classifies his cases as follows :-

- (1) acute bronchitis type of infancy.

- (2) asthmatic bronchitis of the kindergarten age - a recurrent "bronchitis".
- (3) bronchial asthma of the adult type frequently seen in children over five years of age.
- (4) coryzal asthma (hay asthma).
- (5) eczema-asthma - prurigo syndrome.

In his opinion the removal of infected tonsils and adenoids seldom gives rise to more than temporary improvement. Sinus disease he does not regard as common.

Peshkin (53) in an article on asthma in children analyses the role played by diseases of childhood in initiating the onset or allowing the course of asthma.

His conclusions are:- "Among the diseases and conditions responsible for initiating the onset of asthma were the following: pertussis, 15 per cent: acute pneumonia, 14 per cent: measles, 4 per cent: and scarlet fever, 2 per cent - a total incidence of 38 per cent.

Measles, acute pneumonia and diphtheria had a temporarily beneficial effect on the course of asthma. Pertussis aggravated asthma.

Hypertrophied and diseased adenoids and tonsils did not operate as a causative factor of asthma. In 3 per cent of the cases tonsillectomy and adenoidectomy

aggravated the asthma. The removal of tonsils and adenoids did not relieve asthma except in one instance, and in that the relief was only temporary.

Chronic unresolved pneumonia as an etiologic factor occurred in 2 per cent of the cases in the entire series. These patients definitely dated their asthma from an antecedent pneumonia. They were protein nonsensitive and were not tuberculous.

Physical overexertion, indiscretion in diet, especially the eating of ice cream and the drinking of iced liquids, variations of weather, the change of seasons and exposure to winds and freshly painted rooms were important contributory factors in inducing asthmatic attacks."

In this series two cases (Nos. 51 & 52) dated their asthma to one of these diseases, namely whooping cough. In three of the cases a hereditary factor was found (Nos. 53, 54 & 55) and in case 54 it was found that a sister of the patient suffered from asthma.

The radiological appearances varied - in two cases (Nos. 59 & 60) the x-ray appearances of the chest were normal. In one (No. 57) an accessory lobe was present at the right base. In one (No. 56) the appearances were suggestive of bronchiectasis at the right base. In the other cases (Nos. 51, 52, 53,

54, 55 & 58) there was increased striation at the root of the lungs or at the bases.

The bronchoscopic examinations in all of the cases (Nos. 59 & 60) the x-ray appearances of the chest were normal. In one (No. 57) an accessory lobe was present at the right base. In one (No. 56) the appearances were suggestive of bronchiectasis at the right base. In the other cases (Nos. 51, 52, 53, 54, 55 & 58) there was increased striation at the root of the lungs or at the bases.

The bronchoscopic examinations in all of the cases except one (No. 58) showed that the bronchi had a lining of white tenacious mucus which was difficult to aspirate. This has been noted by Jackson (54).

In all ten cases bronchoscopic aspiration proved extremely beneficial - the asthmatic attacks were much less frequent and the cough, which was a prominent feature, was very much relieved.

In the ten cases eight showed a definite gain in weight, while two showed only a slight gain.

In any case the fact remains that these cases were definitely benefited from the treatment.

Commentary on Results.

In coming to a conclusion as to whether bronchoscopic aspiration in the treatment of persistent cough has proved of value, one must investigate the effect of the treatment upon the various symptoms and signs. In all the cases cough was the most prominent symptom and of the fifty cases, excluding the asthmatic children, twenty one cases (42%) showed complete disappearance of the cough; twenty two (44%) diminution in the severity and frequency of the cough, and in seven cases (14%) the cough remained stationery.

In the cases of asthma it was found that, after treatment, three cases had had no asthmatic attacks, while in the other seven the attacks had been less frequent.

To assess the value of the treatment on the general condition of the child the weight has been taken as a fairly reliable factor. Any gain in weight over two and a half pounds has been put down as a definite gain, and any gain of less than that amount as a slight gain. Of the cases reviewed forty-two (70%) showed a definite gain in weight, thirteen (21.6%) showed a slight gain, and in five cases (8.3%) the weight remained stationery.

Commentary on Results (continued)

On going into the question of the disappearance, improvement or persistence of the physical signs, one finds that in twenty-one cases (35%) the abnormal signs had disappeared, in twenty cases (33.3%) there had been improvement in the condition of the lung as revealed by clinical examination, and in nineteen cases (31.6%) the signs showed no change.

In ten cases the symptoms of being easily tired was volunteered and on going into this one finds that, after treatment, the mothers report in two cases that the children are not easily tired, in five cases the symptom has become less marked and in three cases the symptom is still present.

The final result, taking into consideration the disappearance, improvement or otherwise of the various symptoms and signs reveals that fourteen cases have been cured (23.3%), twenty-four have been very much improved (40%) and thirteen have been improved (21.6%) while nine remain in a stationery condition (15%).

SUMMARY.

1. Sixty cases of persistent cough in childhood are analysed.

2. The mechanism of the cough reflex and the natural defences of the lung against disease are shortly reviewed.

3. The cases are divided into three main groups:-

A. Those with clinical signs and no x-ray evidence of disease - eight in number.

B. Those with clinical signs and x-ray evidence of disease - forty two in number - subdivided into

1. cases in which sinus infection is associated - eight in number.

2. cases in which there is no sinus infection - thirty four in number.

C. Cases of Asthma - ten in number.

4. The initial cause of the cough or the pathological condition of the lungs had been investigated and it has been found that pneumonia, whooping cough, or measles are the diseases found responsible.

5. In a small group infection of the maxillary antrum was associated with the chest condition.

6. Bronchoscopic aspiration has been carried out in all the cases reviewed - the total number being one hundred and fifty five.

SUMMARY (continued)

7. The cases in Group A. have all been materially benefited by treatment.

8. Those in Group B.1. have had their sinus condition treated by antral lavage followed in two cases by antrostomy. In addition bronchoscopic aspiration has been carried out.

9. Group B.2. for the purposes of analysis and investigation have been further subdivided, according to the radiological appearances of the chest, into nineteen cases showing increased striation - eleven cases of bronchiectasis, two of which show advanced disease with cavitation, - two cases of unresolved broncho-pneumonia - one case of collapse of a lower lobe and one case of lung abscess. In all the children in this group, with two exceptions, treated, there has been very marked improvement in the local condition. The two exceptions are the cases of advanced bronchiectasis - in one the treatment was discontinued, so one could not draw any conclusions; in the other case there was definite improvement in the general health - a lessening of the amount of expectoration and a diminution of the cough. The size of the cavities remained unchanged, but the amount of pus aspirated was definitely lessened.



SUMMARY (continued)

10. the two unresolved broncho-pneumonias were completely cleared up.

11. The collapse of the lung has been cured - the lower lobe being expanded to normal.

12. The lung abscess has been cured.

13. The cases in Group C. - the asthmatic children - have all benefited very considerably and the attacks have been much less frequent.

CONCLUSIONS.

1. Bronchoscopic aspiration in the treatment of persistent cough in childhood is proved to be of benefit.

2. In chronic bronchitis aspiration of the mucous lining the main bronchi leads to a diminution of the cough, an improvement in the general health of the child, and gain in weight, and to a disappearance of the physical signs in the lungs.

3. It also causes an amelioration of the symptoms in cases of advanced bronchiectasis.

4. In the cases considered to be the precursors of bronchiectasis, by removing the tenacious secretion

CONCLUSIONS (continued)

in the bronchi, it prevents extension of the inflammatory processes.

5. Bronchoscopic aspiration of the contents of a lung abscess allows the inflammation of the infected area, including the surrounding lung tissue, to resolve.

6. In unresolved broncho-pneumonia aspiration leads to resolution.

7. In pulmonary collapse, removal of the obstruction in the bronchus allows the lung to re-inflate.

8. In asthma, aspiration of the tenacious mucus lining the bronchi, which is a feature of such cases, appears to restore to normal the natural methods by which bronchi are cleared of their secretion.

9. The findings of this investigation suggest that in children with lung conditions causing persistent cough, (tuberculosis excepted), bronchoscopic aspiration should be used when routine medical treatment fails to relieve the cough, and that this treatment should be used early and not merely as a last resort.

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GROUP A.

Cases showing abnormal physical
signs with no x-ray evidence of
lung disease.

Nos. 1 - 8.

Donald Houghton. Age 7 years.

No. 1.

Date of first examination. 23.2.33.

Complaint. Cough every winter for several years.

Previous history. Measles at 4 years old.

General appearance. He looks a well developed healthy child.

Weight. 3st. 6lbs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. The percussion note at the left base is slightly impaired. The breath sounds are normal but there are a few crepitations at the left base. The heart is not enlarged and the sounds in all areas are closed.

X-Ray. The chest is normal but the heart shows considerable enlargement.

Medical treatment was continued without improvement until the end of June 1933. Bronchoscopy under general anaesthesia was carried out on 22.6.33. Thin mucus was aspirated from both main bronchi rather more from the left. At the examination a fortnight after bronchoscopy the cough had improved and the crepitations had disappeared from the left base. He did not return for re-examination until sent for in August 1934. It was found that the cough was still present in the mornings only. The impairment of the percussion note was still present at the left base but the breath sounds were normal and there were no accompaniments. Although sent for for re-examination he did not appear.

Joan Friend. Age 8 years.

No. 2.

Date of first examination 1.12.33.

Complaint. Cough of several years' duration.

Previous history. Broncho pneumonia following Measles when $3\frac{1}{2}$ years old.

General appearance. Healthy looking child.

Weight. 3st. 3.1bs. 8ozs.

Examination.

Fauces & Nasopharynx. Tonsils removed when 4 years old.

Chest. Percussion note good over both lungs. Breath sounds harsh all over both lungs. Rhonchi all over both lungs, and a few crepitations at the left base.

X-Ray. Nothing abnormal is shown in the lungs.

Bronchoscopy was performed 13.12.33 under general anaesthesia. Tenacious muco pus was aspirated from both main bronchi. Gomenoleo was introduced. Bronchoscopy has been repeated on four occasions and tenacious muco pus aspirated and gomenoleo introduced on each occasion. When the child was last examined on 15.6.35 the cough had practically disappeared, the chest showed no abnormal physical signs. The child seemed much better and there was a gain in weight of 6.1bs.

Edward Metcalf. Age 5 years.

No.3.

Date of first examination. 5.6.34.

Complaint. Cough ever since birth. Gets easily tired.

Previous history. Pneumonia following measles at $3\frac{1}{2}$ years old.

General appearance. He is a healthy looking boy.

Weight. 2st. 12.1bs. 2ozs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. There is a slight impairment of the percussion note at right base and the breath sounds are diminished in that area. Numerous rhonchi are heard all over both lungs.

X-Ray. There is no abnormal enlargement of root glands. The x-ray appearances of the chest are normal.

On 28.6.34 Bronchoscopy was performed under general anaesthesia. Both main bronchi were quite clear and the bronchoscopic appearances were normal. Following bronchoscopy the cough improved a little and he was fairly free from symptoms for a little over a month. The cough gradually returned and on 4.10.34 bronchoscopy was repeated under general anaesthesia. Tenacious muco pus was aspirated from the upper part of the right main bronchus - the bronchi appeared healthy. He improved after this treatment and when examined in January 1935 there was practically no cough - the dullness on percussion was still present and there were no rhonchi heard.

Trevor Harrison. Age 7 years.

No.4.

Date of first examination 4.7.34.

Complaint. Frequent bronchitis.

Previous history. Whooping cough at 2 years and nine months old. Since then recurring bronchitis with temperature. Measles at 6 years old. He has not had pneumonia. Treated by his own doctor by stock vaccines a year ago without improvement.

General appearance. He is a well developed rather fat boy.

Weight. 5st. and 8ozs.

Examination.

Fauces & Nasopharynx.

The tonsils are slightly enlarged but quite clean. There is a very small amount of adenoid tissue.

Chest. The expansion of both sides of the chest is good and equal. The percussion note is impaired over the right root and there is area of dullness at the base of the left lung close to the vertebral column. There are no accompaniments. Clinically the heart is not enlarged. The apex beat is in the 5th interspace internal to the nipple line. The heart sounds are closed in all areas.

X-Ray. The x-ray appearance suggests a degree of cardiac enlargement.

Bronchoscopy was performed under general anaesthesia on 16.8.34. Very little mucus was aspirated from both main bronchi. The posterior division of the left lower lobe bronchus collapsed readily with expiratory cough.

Trevor Harrison (continued)

He remained free from cough and feverish attacks until October 1934. He ran a slight temperature for a few days but had no cough. He was examined in December and his Mother states that he had been able to go to school regularly during November, the first time for four years. When he was seen in February his Mother reported that this January was the first for four years that he had not had to go to bed with bronchitis. He had an attack of influenza in March and ran a slight evening temperature up to 99° for nearly three weeks. During the early part of June he had again an evening rise of temperature for about 10 days, but only a very slight cough. When examined on 15.6.35 the chest showed no abnormal physical signs and the child was definitely better.

Marjorie North. Age 3 years.

No.5

Date of first examination. 11.10.34.

Complaint. Cough for the past year and two months.

Previous history. Pneumonia at $1\frac{3}{4}$ years old.
Tonsillectomy at $2\frac{1}{2}$ years old.

General appearance. A healthy looking child.

Weight. 2st. 9.1bs.

Examination.

Fauces & Nasopharynx. Tonsils removed.

Chest. Slight impairment of percussion note at right base in posterior axillary line. Breath sounds not well heard - numerous rhonchi and crepitations in that area.

X-Ray. Nothing abnormal shown in the chest.

The cough improved under medical treatment until March 1935 when it became as troublesome as before. Bronchoscopy was performed under rectal paraldehyde on 21.3.35. Tenacious mucus was aspirated from the right main bronchus. The cough improved almost at once and when examined in May has disappeared entirely. The air entry at the right base was still poor but there were no accompaniments. There had been a slight gain in weight of nearly three pounds.

Enid Taylor. Age 12 years.

No.6

Date of first examination 6.2.35.

Complaint. Persistent cough for two years.

Previous history. Pneumonia at 1yr and 4 mths old.
Measles at 4 years old.

General appearance. A rather tall thin girl
with sallow complexion.

Weight. 5st. 5.lbs. 2ozs.

Examination.

Fauces & Nasopharynx. Tongils small -
no adenoids.

Chest. Percussion note impaired at the
left base. Air entry poor at the
left base. No accompaniments.

X-Ray. Nil.

Bronchoscopy was carried out on the 14.2.35 under evipan anaesthesia. Some tenacious mucopus was aspirated from the left main bronchus. The bronchoscope used was rather short and did not reach to the lower lobe bronchus. Bronchoscopy was repeated on 14.3.35. under evipan anaesthesia a longer bronchoscope being used. Some tenacious mucopus was aspirated from the left main bronchus and the posterior branch of the left lower lobe bronchus was seen to be collapsed. An unsuccessful attempt was made to open it up by administration of carbon di-oxide through the bronchoscope. The cough became less after the treatment and the air entry, though still poor at the left base, improved somewhat. When examined at the end of June there was only very occasional cough and the child looked better. There had been a gain in weight of nine pounds.

George Trafford. Age 5 years.

No.7

Date of first examination. 19.2.35.

Complaint. Persistent cough since measles at four months old.

Previous history. Measles at 4 months old
Whooping cough and Pneumonia
at 2½ years old.

General appearance.
A healthy looking well developed boy.

Weight. 2st. 6.1bs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. Dullness on percussion at the left base. Breath sounds high pitched at left base. Rhonchi over both lungs. A few crepitations at the left base.

X-Ray. Normal appearance.

Bronchoscopy was performed on 28.2.35 under rectal paraldehyde. A small quantity of tenacious mucus was aspirated from both main bronchi. After bronchoscopy the cough improved a great deal and the physical signs in the chest cleared up until May. When he came up for examination on 4.5.35 his Mother reported that he had been in bed with a feverish attack lasting for five days. There was a return of the cough and a few crepitations were heard at the left base. He improved again and when seen on 29.6.35 the cough had practically gone. The chest showed no abnormal physical signs and the boy was much better.

Jessica Nightingale. Age 6 years.

No.8.

Date of first examination 26.3.35.

Complaint. Cough for the past two winters.

Previous history. Measles with pneumonia when
1yr.10 mths old.
Whooping cough when 5 yrs. old.

General appearance. Healthy looking child with
good colour.

Weight. 2st. 12lbs.

Examination.

Fauces & Nasopharynx. Nothing abnormal.

Chest. Percussion note good all over both
lungs. Breath sounds normal. A
few crepitations at the left base.

X-Ray. Sinuses normal. Chest - no evidence
of bronchiectasis.

On 4.4.35 bronchoscopy was performed under evipan anaesthesia. Thin mucoid pus was seen to be coming from the posterior branch of the left lower lobe bronchus. The right main bronchus was quite clear. After aspiration gomenoleo was introduced into the left main bronchus. She was examined regularly following this treatment and the cough improved. When she was seen on 22.6.35 the cough has completely disappeared, the appetite was good and the child appeared fitter. There were no abnormal physical signs in the chest.

Ampley Martin, age 10 years.

10.7

Date of first examination, 10.11.71.

Complaint. Cough with sputum for the past 3 years or more.

Family History. Father died of heart failure at 5 years and mother died of heart failure at 7 years. He was admitted to the hospital and died of heart failure. She was admitted to the hospital and died of heart failure.

GROUP B. 1.

Cases showing abnormal physical signs with x-ray evidence of lung disease associated with sinus infection.

Nos. 9 - 16.

Stanley Martin. Age 10 years.

No.9

Date of first examination 7.11.33.

Complaint. Cough each winter for the past seven or eight years.

Previous history. Pneumonia twice, at 3 years and 5 years. Whooping cough at 7 years. He was admitted to the Sanatorium when 5 years old - he was an in-patient for 6 months. Again when 7 years old for eleven weeks. On each occasion he was discharged as non-tubercular.

Appearance. He is rather a pale and anaemic child with a pigeon chest.

Weight. 3st. 4.1bs. 4ozs.

Examination.

Fauces & Nasopharynx. Tonsils small and no evidence of adenoids.

Chest. The chest expansion is very poor. There is impairment of the percussion note at the right root and right base. The breath sounds are harsh all over both lungs and the air entry at the right base is poor. No accompaniments present.

X-Ray. There are signs of an old diaphragmatic pleurisy on the right side with root fibrosis. There is an old calcified focus in the second right interspace.

Bronchoscopy was carried out on 16.11.33 under general anaesthesia. Profuse muco purulent discharge was aspirated from both main bronchi. The right lower lobe bronchus did not expand well and a good deal of discharge was aspirated from it. Bronchoscopy was repeated on 14.12.33 and again on 4.1.34. Tenacious muco pus was aspirated from the right main bronchus on both occasions, and gomenoleo was introduced. The cough improved

Stanley Martin (Continued)

after treatment but the impairment of percussion note and diminished air entry at the right base remained. In March the cough returned and there was some expectoration mostly in the morning. Bronchoscopy was repeated on 19.4.34. Mucopus was aspirated from both main bronchi and the posterior branch of the right lower lobe bronchus was seen to be collapsed. He improved again until the beginning of June when the cough became more troublesome. On examination a few crepitations were heard at the right base. Bronchoscopy was again performed on 7.6.34 and tenacious mucopus was aspirated from the right main bronchus and gomenoleo introduced. This treatment was repeated a month later. He again improved and the adventitious sounds disappeared from the right base although the dullness and diminished air entry remained. In October he was found to be suffering from a severe Coryza. On x-ray a dense opacity of both antra was found. Double antral lavage was done on 25.10.34 and pus was found in both antra. This lavage was repeated on 7.11.34 and pus was again found in both antra. He has been examined at regular intervals since but the cough is still troublesome although there is no expectoration. The physical signs at the right base remain stationary and there does not appear to be much improvement in the general condition. The weight has only increased 1.1b 12.0zs during the whole period.

No. 9.



Old right diaphragmatic pleurisy
and root fibrosis.

Doreen Taylor. Age 7 years.

No.10

Date of first examination 23.6.34.

Complaint. Persistent cough for several years.

Previous history. Pneumonia three times - at 18 mths, at 2 years and at 4½ years. Was an inpatient in hospital two years ago with fluid in the chest. Measles at 5 years old. Was treated for cough four months ago with postural coughing.

General appearance. Healthy looking child with malor flush.

Weight. 3st. 7.1bs. 12ozs.

Examination.

Fauces & Nasopharynx. Normal.

Chest. Dullness on percussion at the left base, with poor air entry and a few rhonchi.

X-Ray. Shows a patch of consolidation at the left base.

On 5.7.34 bronchoscopy was performed under general anaesthesia. Some muco pus was aspirated from the trachea and both main bronchi. The cough improved slightly after bronchoscopy until September 1934 and bronchoscopy was repeated on 4.10.34 under general anaesthesia. A small amount of tenacious muco pus was aspirated from both main bronchi. The cough improved again after the treatment and an x-ray taken in October 1934 showed that the left base had cleared considerably. The cough returned in December and on x-ray examination both antra were found to be opaque. Bilateral antral lavage on 13.12.34 revealed the presence of pus in both antra. On 22.12.34 discharge from the right ear was reported but this cleared up in about ten days. At the end of January 1935 she developed a feverish attack and the cough was accompanied by vomiting.

Doreen Taylor (Continued)

The dullness at the left base was still present and there were numerous rhonchi at both bases. The cough again improved but returned in April 1935 with another febrile attack. When this subsided the child again began to improve and when examined in May 1935 the cough was much less - there was no vomiting and the appetite was good. There was still some impairment of the percussion note, but there were no accompaniments.

No.10.



Patch of consolidation at the left base.

No.10.



After treatment.

The left base is perfectly clear.

Annie Ansdell. Age 12 years.

No.11

Date of first examination 8.8.34.

Complaint. Persistent cough since 5 years old.

Previous history. Whooping cough when 5 years old.

Measles when 6 years old.

Tonsillectomy when 6 years old.

Severe bronchitis when 9 years old.

Pneumonia (double) when 11 years old.

Sputum has been examined for T.B. and found negative.

General appearance. She is rather a tall girl for her age and well developed. She has rather a pale complexion with a slight malar flush.

Examination.

Fauces & Nasopharynx. Tonsils removed. No evidence of adenoids. On examination of the nose pus was present.

Chest. There is some flattening of the left side of the chest and this side does not expand as fully as the right side. The percussion note at the left base posteriorly is somewhat impaired, and a few rhonchi and crepitations are heard in that area.

X-Ray. Appearances of the left base suggest bronchiectasis. There is dense opacity of both antra. The ethmoid cells also appear to be involved.

On 16.8.34 double antral washout was performed under sodium evipan. A quantity of pus was washed out from both antra. On 22.9.34 double antrostomy was performed under general anaesthesia. On 25.10.34 bronchoscopy was performed under evipan anaesthesia and a quantity of pus was aspirated from both lower lobe bronchi. After this treatment the cough became much less and on 15.11.34 bronchoscopy was repeated. On this occasion pus was again aspirated from both lower lobe bronchi - but much less in quantity

Annie Ansdell (continued)

than on the previous occasion. 5ccs gomenoleo was introduced. The cough continued to be troublesome in the morning and some sputum was brought up each day. When the chest was examined in December it was found to be practically clear. It remained so until April 1935 when she had a mild attack of Influenza. The cough returned and a few crepitations reappeared at the left base. Bronchoscopy was repeated on 23.5.35 and some tenacious muco pus was aspirated from both lower lobe bronchi. The chest again cleared up and on 15.6.35 no abnormal signs were to be made out. The child looks, and is, much fitter and not so easily tired.

No. 11.



Appearances suggest bronchiectasis at the
left base.

Doreen Reader. Age 5 years.

No. 12.

Date of first examination 30.10.34.

Complaint. Cough for 2 years.

Previous history. Whooping cough when 3 years old.
Tonsillectomy August 1934.
Antral suppuration with lavage
September 1934.

General appearance. A healthy looking child.

Weight. 2st. 10.1bs. 6ozs.

Examination.

Fauces & Nasopharynx. Tonsils removed.

Chest. Percussion note good.
Numerous rhonchi all over both lungs.
A few crepitations at both bases.

X-Ray. Appearances suggest the possibility
of bronchiectasis at the left base.

Bronchoscopy was carried out on 1.11.34 and a great deal of muco pus was aspirated from both main bronchi. In December she developed measles and the cough became more troublesome following the illness. The breath sounds were somewhat harsh at the left base with numerous crepitations. Bronchoscopy was repeated on 7.2.35 under general anaesthesia and tenacious muco pus was aspirated from both main bronchi. When she was seen in March 1935 the cough had disappeared - she looked much fitter and the abnormal physical signs had disappeared from the lungs.

No.12.



Appearances suggest bronchiectasis at the left base.

Mabel Stockdale. Age 12 years.

No.13

Date of first examination 4.11.34

Complaint. Persistent cough. Gets colds easily.

Previous history. Pneumonia during the past two winters.

General appearance. She is a healthy looking well-developed girl.

Weight. 5st. 4.lbs.

Examination.

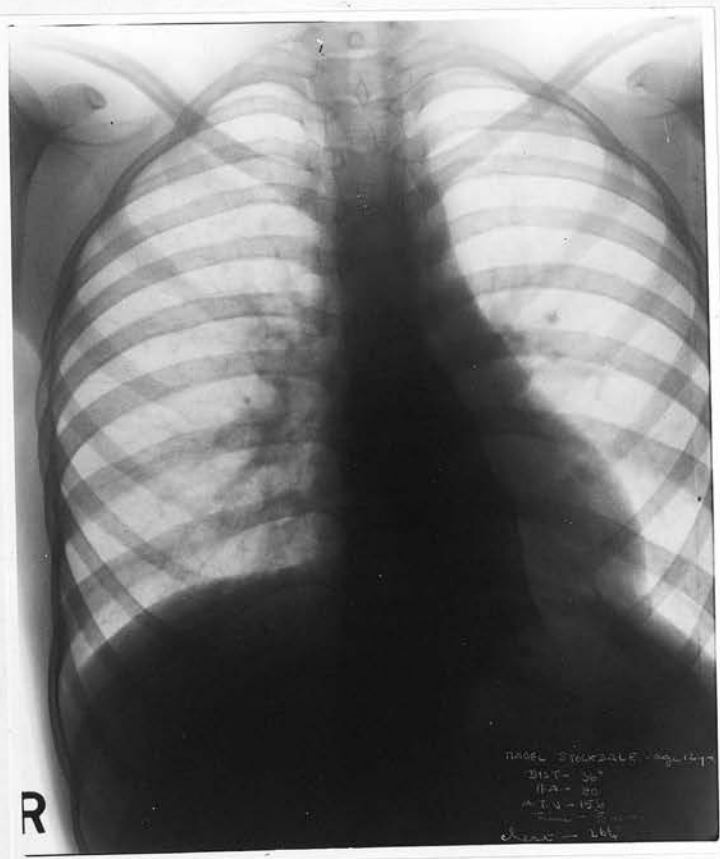
Fauces & Nasopharynx. Tonsils slightly enlarged but healthy - no adenoids. Some mucus in nasopharynx.

Nose. Slight nasal discharge and enlargement of the left inferior turbinal. On Transillumination the left antra did not light up as well as the right.

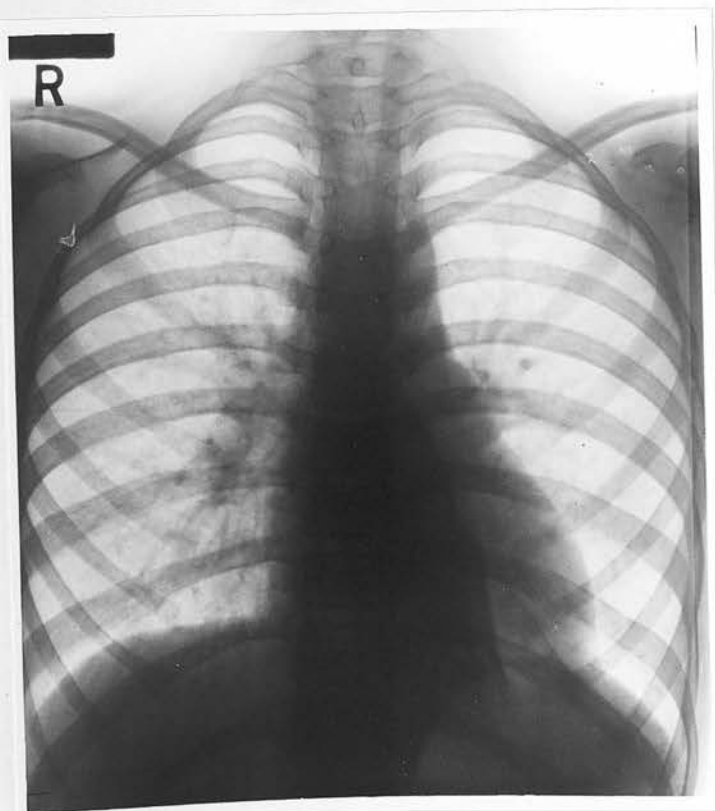
Chest. Dullness on percussion at the left base close to the vertebral column and extending outwards to nearly the posterior axillary line. The breath sounds in that area were high pitched in character and there were numerous crepitations.

X-Ray. Both antra were opaque. The chest showed atelectatic bronchiectatic lobe at the left base.

In the first instance the antra were washed out and both were found to contain pus. Bilateral antrostomy was then done in January 1935. Bronchoscopy was performed under general anaesthesia and tenacious muco pus was aspirated from the left main bronchus. Carbon dioxide was then administered through the bronchoscope and the child was X-Rayed immediately afterwards. This x-ray showed no diminution of the collapsed areas. The cough continued to be troublesome but there was some slight improvement. The physical signs remained unchanged but in March and in June 1935 when she was re-examined, the accompaniments had disappeared.



Atelectatic bronchiectasis left base.



No diminution of the collapsed area after bronchoscopy
and C.O.₂ inhalation.
(82)

Josephine Thwaites. Age 8 years.

No.14

Date of first examination 17.11.34.

Complaint. Persistent cough for over a year.

Previous history. Whooping cough when 4 years old.
Measles when 5½ years old.
Tonsillectomy when 7 years old.
Antral suppuration and antral
lavage October 1934

General appearance. A healthy looking well-developed child.

Weight. 3st. 13.lbs.

Examination.

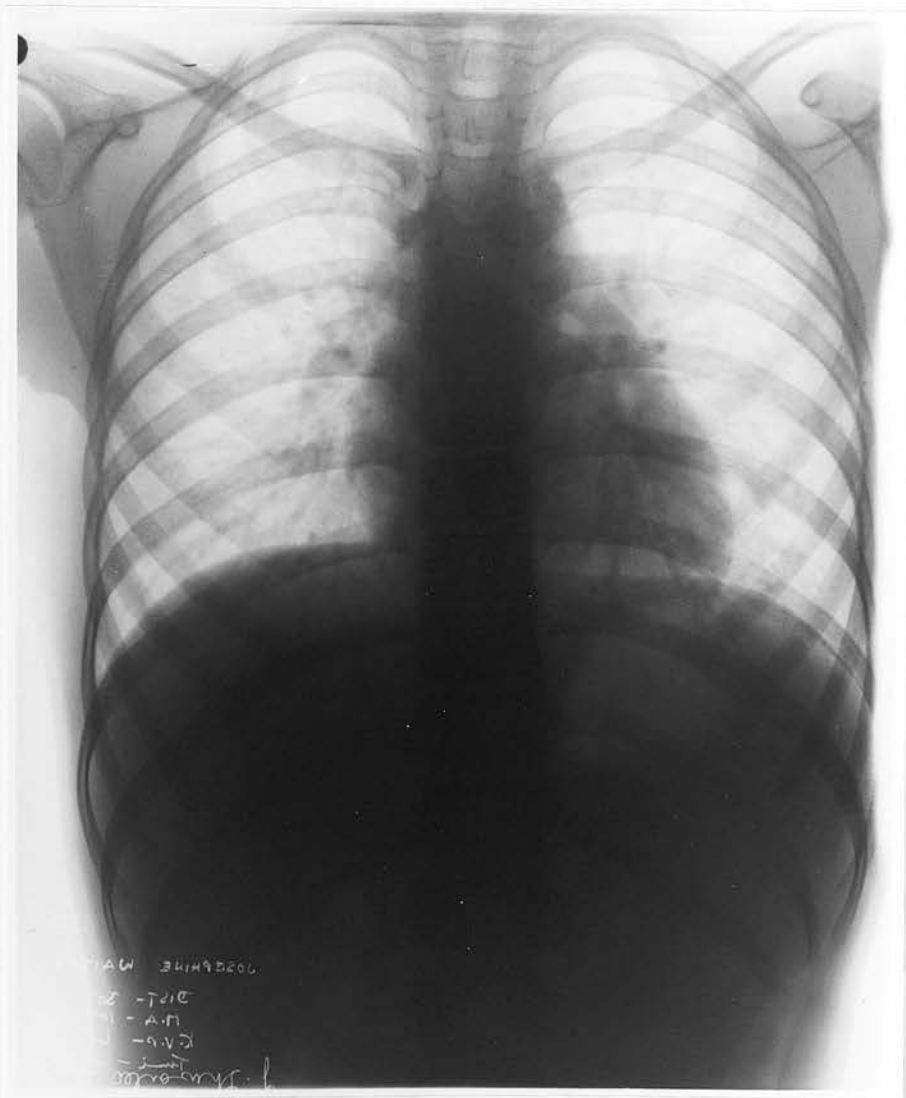
Fauces & Nasopharynx. Healthy.

Chest. No dullness on percussion. Breath sounds harsh at the left base. No accompaniments.

X-Ray. Increased striation at both bases.

On 29.11.34 bronchoscopy was performed under evipan anaesthesia, both main bronchi were clear. The child has been examined at frequent intervals since November 1934. The cough has become less and the appetite has improved. There has been a gain in weight of 3 lbs in the last six months. The physical signs in the chest were normal at the last examination on 22.6.35.

No. 14.



Increased striation at both bases.

Cyril Walton. Age 6 years.

No.15

Date of first examination 24.11.34

Complaint. Cough for past nine months -
recurring winter bronchitis.

Previous history. Measles at 4 years of age.

General appearance. He is a fairly well -
developed boy.

Weight. 3st. 2.1bs.

Examination.

Fauces & Nasopharynx. Tonsils enlarged and
unhealthy. Some nasal
discharge.

Chest. Marked dilatation of the superficial
veins. Percussion note normal over
both lungs. Poor air entry at both
bases. Numerous rhonchi heard all
over both lungs.

X-Ray. There is no evidence of disease
radiologically. Both antra are
opaque.

As a preliminary the tonsils were enucleated on
13.12.34. The cough continued to be troublesome
and bronchoscopy was performed on 7.6.35 under
evipan anaesthesia. Some tenacious mucus was
aspirated from both main bronchi. On 14.3.35.
bilateral antral lavage was carried out. The cough
began to improve but as the boy was not looking
very fit and not gaining weight he was given
ultra violet light. Since March 1935 the cough
has steadily improved, - the boy is looking fitter.
There has been a gain in weight of five pounds
when he was examined in June 1935. The air entry
at the bases was still poor but had improved
slightly.

No. 15.



No X-Ray evidence of lung disease.

David Cawkwell. Age 5 years.

No.16

Date of first examination. 18.5.35

Complaint. Persistent cough for past 8 months.

Previous history. Measles when 5 years old.
Tonsillectomy in Sept.1934
Antral suppuration February 1935 -
left antrum washed out in March 1935.

General appearance. A rather pale child but
well developed.

Weight. 3st. 2.lbs. 10ozs.

Examination.

Fauces & Nasopharynx. Tonsils removed -
No evidence of adenoids.

Chest. Percussion note good all over both
lungs. Breath sounds diminished at
the right base. A few rhonchi heard
at the right base.

X-Ray. Some increased striation at the
right base.

Bronchoscopy was performed on 30.5.35 under
general anaesthesia. Tenacious mucus was
aspirated from both main bronchi. The terminal
bronchi appeared clear and healthy. When he
was examined a month later on 22.6.35 the
cough seemed a little better but the physical
signs in the chest were the same as at the
first examination.

No. 16.



Increased striation at the right base.

Joseph Keogh. Age 10 years.

No.17

Date of first examination. 1.6.33.

Complaint. Persistent cough for the past three years. Always tired and listless.

Previous history. Pneumonia at 7 years old, following measles.

General appearance. He is a fairly well nourished boy and is well developed. His complexion is sallow and he does not look fit.

Weight. 4st. 11.1bs.

Examination.

Fauces & Nasopharynx. Nothing of note.

Chest. The expansion is poor at the right base. The percussion note in that area is impaired. The breath sounds over the right lower lobe are harsh with a prolonged expiratory phase. There are numerous crepitations heard at the right base.

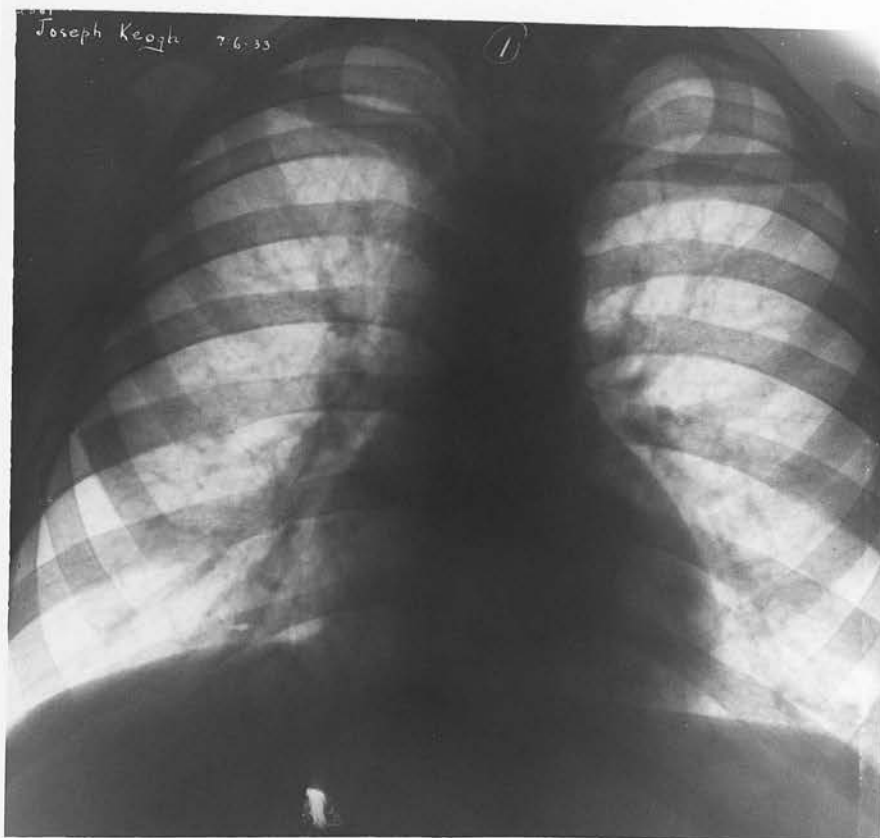
X-Ray. There is slight root thickening at both sides, and some increased striation at the right base.

On 22.6.33 Bronchoscopy was performed under general anaesthesia. Muco pus was aspirated from the right main bronchus. After bronchoscopy the boy seemed much better, and the cough disappeared and the physical signs improved. He returned in October with the same symptoms of cough and being easily tired. The physical signs in the lungs were practically the same as in June. Bronchoscopy was carried out on 5.10.33 and again on 19.10.33. On the first occasion thick muco pus was aspirated from the right main bronchus and on the second only a little mucus was removed from the bronchus. The cough remained very troublesome and the physical signs did not clear up. Bronchoscopy was repeated on 20.12.33 some muco pus was aspirated from the right main

Joseph Keogh (continued)

bronchus and gomenoleo was introduced. The cough then began to improve but the signs in the chest remained the same. An X-Ray taken in January 1935 showed practically no change in the appearances in the lung though the right base had cleared somewhat since the first examination. When he was examined in June 1934 there was no cough during the day and only very occasionally at night. He did not tire so easily and the appetite was good and there was a slight gain in weight. There was no change in the physical signs in the lungs.

No.17.



Slight thickening both roots and increased striation
at right base.

Clara Tuton. Age 6 years.

No.18

Date of first examination 11.10.33.

Complaint. Cough for the past year with no improvement.

Previous history. Measles at 5 years old.
Pneumonia and empyema $5\frac{1}{2}$ yrs old.
Tonsillectomy $5\frac{1}{4}$ years old.

General appearance. She is a healthy looking well-developed child but her complexion is shallow.

Weight. 3 stone.

Examination.

Fauces & Nasopharynx.

Tonsils have been removed.

Chest. The empyema wound in the right side is firmly healed. The chest expansion on that side is less than on the other. The percussion note is impaired over the right root and right lower lobe in the axillary line. The breath sounds are harsh over both lungs. There are no accompaniments.

Mantoux Reaction. Negative.

X-Ray. There is an increase in root density on both sides with some mottling extending outwards into the parenchyma on the left side.

On 25.10.33 Bronchoscopy was performed under general anaesthesia. A considerable amount of tenacious muco pus was seen at the entrance to the left bronchus. A little was also present at the entrance to the right bronchus. This was aspirated. The cough did not improve and bronchoscopy was repeated on 20.12.33 under general anaesthesia. Some tenacious muco pus was aspirated from the right main bronchus and gomenoleo introduced. The cough continued to be

Clara Tuton (continued)

very troublesome and the child did not improve. An X-Ray taken in January 1934 showed that the appearance of the lung was more nearly normal. In February 1934 she was admitted to the hospital for observation and was put on the balcony, as the cough was very frequent and there were numerous rhonchi all over both lungs. Bronchoscopy was carried out on 7.3.34 and the trachea and both main bronchi were clear. Whilst in hospital she improved a good deal - the cough became less and she put on $1\frac{1}{2}$ lbs in weight in three weeks. She was discharged to a convalescent home for a fortnight but when re-examined a month after discharge from hospital the cough had returned and the chest was again full of rhonchi. Bronchoscopy was repeated on 26.4.34 under general anaesthesia. Tenacious mucus was aspirated from both main bronchi and gomenoleo was introduced. The cough still continued and bronchoscopy was again carried out on 31.5.34. Only a small amount of mucus was aspirated. As the general condition of the child was poor it was decided to give a course of ultra violet light. As the cough still continued bronchoscopy was repeated on 24.1.35 and tenacious mucus was aspirated from the middle and lower lobe bronchi on the right side. She was re-admitted to the hospital in February 1935 and remained on the balcony for six weeks. During this period her cough improved a good deal and in view of the improvement while in the fresh air it was arranged that she should go to the open air school in May. When re-examined in June 1935 the mother reported that the cough - although troublesome - was a little better. The air entry at the right base still remained very poor and there were a few rhonchi heard over both lungs.



Dals

Increase in root density both sides
some mottling in left lung field.



Dals

X-Ray appearances are more nearly normal.

Audrey Lister. Age 4 years.

No.19

Date of first examination 11.4.34.

Complaint. Recurring cough.

Previous history. Pneumonia (twice)

General appearance. She is a well developed and well nourished child.

Weight. 2st. 7.lns. 2ozs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. The percussion note is good in all areas. The breath sounds are normal except at the left base where they are harsh in character. There are numerous rhonchi at the left base and a few crepitations.

X-Ray. There is increased hilar striation possibly following on an inflammatory condition of the lungs which has subsided.

Bronchoscopy was performed under general anaesthesia on 19.4.34. The trachea and both main bronchi were clear. Following bronchoscopy the cough improved for about a fortnight. Bronchoscopy was repeated on 10.5.34. At the examination both main bronchi were quite clear but in view of the history of the recurring cough it was decided to introduce 5 ccs. gomenoleo. The symptoms gradually improved until August when there was a return of the cough - this continued to be troublesome and bronchoscopy was again performed on 25.10.34. Again both main bronchi were found to be quite clear. The cough continued to be troublesome and in January 1935 the attacks of coughing were accompanied by vomiting. An X-Ray taken in January showed practically the same appearance as in April 1934.

3

Audrey Lister (continued)

Bronchoscopy was again carried out on 27.3.35 under rectal paraldehyde. Tenacious mucopus was aspirated from the left main bronchus and gomenoleo was introduced. Following this treatment the cough began to improve and the physical signs in the chest disappeared.

No. 19.



Increased hilar striation.

George Barr. Age 9 years.

No. 20.

Date of first examination 20.4.34.

Complaint. He has had a cough for the past four years. He gets easily tired on exertion.

Previous history. Congestion of the lungs at 5 years old. Pneumonia January 1934.

General appearance. He is a well developed healthy looking boy.

Weight. 4st. 9.1bs. 8ozs.

Examination.

Fauces & Nasopharynx. Tonsils small - no evidence of adenoids.

Chest. There is impairment of the percussion note at the right base. The breath sounds in that area are harsh with prolongation of the expiratory phase. There are no accompaniments to be heard.

X-Ray. The X-Ray shows increased striation running down from the right root to the right base.

On 10.5.34 Bronchoscopy was performed under general anaesthesia. No mucus was aspirated from the trachea or bronchi. The mucous membrane appears healthy. Further bronchoscopy not considered necessary. The cough improved a little following bronchoscopy. He has been examined at intervals of about a month and the condition has remained stationary. In May 1935 the examination of the chest revealed the same physical signs as at the first examination.

No.20.



Increased striation running down from the right
root to the right base.

Joyce Walton. Age 5 years.

No.21

Date of first examination 22.5.34.

Complaint. Persistent cough for one year.

Previous history. Pneumonia followed by right sided empyema when four years old.
Measles at $1\frac{1}{2}$ years old.
Tonsillectomy when $3\frac{1}{2}$ years old, - followed by removal of right cervical glands.

General appearance. She is a well developed healthy looking girl.

Weight. 2st. 8.lbs. 8ozs.

Examination.

Fauces & Nasopharynx. Tonsils small - no adenoids.

Chest. There is a very slight impairment of the percussion note at the right base. The breath sounds are diminished in intensity and a few rhonchi are heard in that area.

X-Ray. Two x-rays taken during illness in 1933.
18.7.33 shows unresolved pneumonia in the right lung.
1.8.33. Marked opacity of the right chest with displacement of the heart to the left. The appearances suggest the presence of a large pleural effusion or empyema.

X-Ray.30.5.34. Some increased bilar shadow to the right, otherwise the x-ray appearances of the chest are normal.

On 7.6.34 Bronchoscopy was performed under general anaesthesia. Both main bronchi were clear and appeared quite healthy. Following the bronchoscopic examination the cough improved a good deal. The dullness at the right base remained stationery but the accompaniments disappeared. She was told to report if the

Joyce Walton (continued)

cough returned, but as she did not come back she was sent for for re-examination at the end of June 1935. The cough had quite disappeared and she had kept quite well during the winter. The slight dullness - most probably due to thickened pleura - was still present at the right base but the breath sounds were normal and there were no accompaniments.



Unresolved pneumonia right lung.



Increased hilar shadow to the right.

Joseph Oakley. Age 8½ years.

No.22

Date of first examination 26.6.34.

Complaint. Persistent cough for the past two years. Always feels tired.

Previous history.

Pneumonia at 2 years old.
Pneumonia at 6½ years old - lobar pneumonia right lower lobe.
Whooping cough at 6 months old.
Measles when a baby.

General appearance. He is a healthy looking boy, and well developed.

Weight. 4st. 5.1bs. 12ozs.

Examination.

Fauces & Nasopharynx. Tonsils small - no evidence of adenoids.

Chest. The percussion note is impaired at right root and into the right axilla. The breath sounds are diminished at the right base. There are a few crepitations in the posterior axillary line.

X-Ray. This shows increased root thickening on the right side with some increased striation in the right lower lobe.

On 5.7.34 Bronchoscopy was performed under general anaesthesia. A little tenacious mucus was aspirated from the right main bronchus. The terminal bronchi appeared healthy. The cough improved a little after bronchoscopy but was still troublesome in the mornings. Bronchoscopy was repeated on 19.7.34 under general anaesthesia and a very little tenacious mucus was aspirated from the right main bronchus. When he was examined at the end of August 1934 the cough had practically disappeared. He was looking better and had gained a pound and a half in weight. The dullness had disappeared but the air entry was still poor at the right base. The breath sounds were normal and there were no accompaniments.

No. 22.



Increased root thickening on the right side and
increased striation in the right lower lobe.

Kenneth Rowe. Age 7½ years

. No.23

Date of first examination 26.6.34.

Complaint. Chronic cough for three years.

Previous history. Pneumonia at 4½ years old.

General appearance. He is a well developed boy physically but mentally he is definitely backward.

Weight. 3st. 6.lbs. 10ozs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no evidence of adenoids.

Chest. There is impairment of the percussion note at the left base. The air entry is poor at both bases. The breath sounds at the right base are harsh with prolongation of expiration. Rhonchi are heard at both bases.

X-Ray. There is increased shadow at the right root and increased striation at both bases.

On 5.7.34 Bronchoscopy was performed under general anaesthesia. Mucopus was aspirated from the right main bronchus. Gomenoleo 5 ccs. was injected. He improved a little after bronchoscopy and this was repeated on 19.7.34. A small amount of tenacious mucopus was aspirated from the right main bronchus. When examined a month after the cough had practically disappeared, and the dullness had disappeared. The cough, however, returned in May 1935 following a febrile illness in April. Bronchoscopy was therefore repeated on 30.5.35. A small amount of mucopus was aspirated from both main bronchi. When examined a week later the cough had improved but there were still some rhonchi heard at both bases.

No. 23.



Increased right root shadow and increased
striation at both bases.

John Friend. Age 6 years.

No. 24

Date of first examination 13.11.34

Complaint. Cough since 2 years of age.
Easily tired.

Previous history. Broncho pneumonia following measles at 2 years old. Has had pneumonia twice since. Was an inpatient in tuberculosis sanatorium six months ago and discharged as non-tubercular.

General appearance. Well developed healthy looking boy.

Weight. 2st. 12.1bs. 10ozs.

Examination.

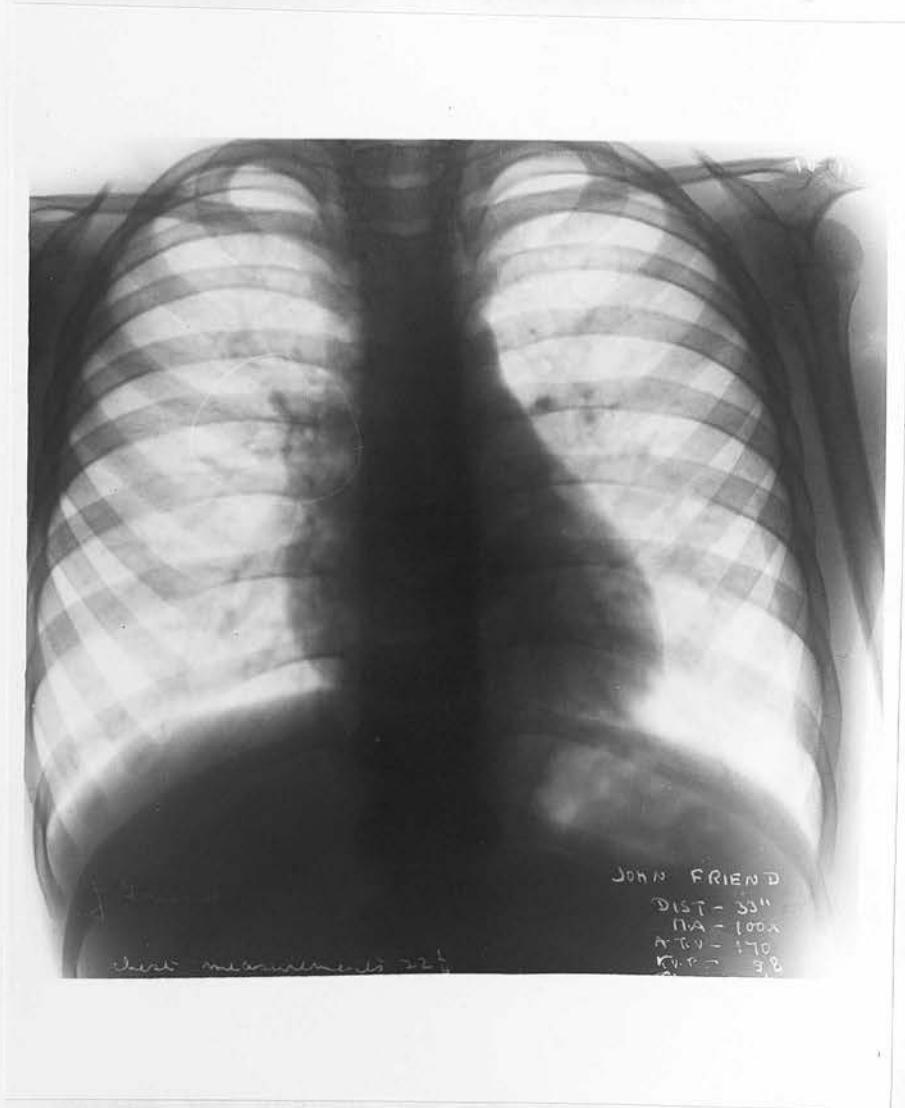
Fauces & Nasopharynx. Tonsils slightly enlarged - no adenoids.

Chest. Dullness over the root of both lungs posteriorly. Breath sounds harsh at left base, diminished air entry at the right base. No accompaniments.

X-Ray. There is some extension of the upper part of the right root shadow.

Medical treatment was continued until 31.1.35 without any improvement. On that date a laryngoscope was passed but the child vomited and bronchoscopy was not proceeded with. For the next five weeks the cough improved but at the beginning of April the child had a feverish cold and the cough became more troublesome. On 18.4.35 bronchoscopy was performed under rectal paraldehyde. Mucopus was aspirated from the right main bronchus and the right middle lobe bronchus. 4ccs. gomenoleo was introduced into the right bronchus. Since the treatment the cough has improved and the child is less easily tired. At the date of the last examination 15.6.35 the air entry was still poor at the right base but no accompaniments were heard.

No. 24.



Extension of the upper part of the right root shadow.

Iris Farr. Age 8 years.

No.25

Date of first examination 5.2.35.

Complaint. Cough for nine months.

Previous history. Whooping cough nine months
prior to first examination.

Family history. Grandmother and maternal
Aunt died of Tuberculosis.

General appearance. A healthy looking well
developed child.

Weight. 3st. 10.lbs. 3ozs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. Percussion note impaired over the
right root. Poor air entry at the
right base. Breath sounds normal.
No accompaniments.

X-Ray. Shows some increased striation at
the right root and running down to
the right lower lobe.

On 25.2.35 Bronchoscopy was performed under
evipan anaesthesia. Some mucus was aspirated
from both main bronchi and the terminal bronchi
were found to be clear. The cough improved soon
after bronchoscopy. When she was re-examined at
the end of June 1935 the cough had quite
disappeared - the child looked very well and the
appetite was good. She had gained three pounds
during the period she had been under observation.
The examination of the chest revealed no abnormal
physical signs.

No. 25.



Increased striation at the right root and running
down to the right lower lobe.

Joyce Grantham. Age 6 years.

No.26

Date of first examination 14.2.33.

Complaint. Cough for the past three years.

Previous history. Pneumonia at 3 years old.
Whooping cough.
Measles.

General appearance. She is a fairly well
nourished child.

Examination.

Fauces & Nasopharynx. Tonsils normal -
no adenoids.

Chest. The percussion note is good in all
areas. The breath sounds show slight
prolongation of the expiratory phase.
There are numerous rhonchi all over
both lungs especially at the bases.

Sputum. Negative for tubercle bacilli.

Mantoux reaction. Negative.

X-Ray. There is no x-ray evidence of T.B. or
bronchiectases, but some increased
striation of the left lung field.

On 22.6.33. Bronchoscopy was performed under
general anaesthesia. Tenacious mucus was
aspirated from both main bronchi. On 3.7.33
bronchoscopy was repeated and some tenacious
mucus aspirated from both main bronchi - but
less in amount than before. Bronchoscopy was
again carried out on 20.7.33. Both main bronchi
were clear and the mucous membrane was normal in
appearance. The cough disappeared after
bronchoscopy and the chest was quite free from
abnormal physical signs. The general condition
was improved and there was a gain in weight.
The mother was asked to bring the child up for
examination if there was any return of the cough
but as she has not appeared the presumption is
that there has been no return of the symptoms.

No. 26.



Some increased striation of the left lung field.

Betty Stone. Age 8 years.

No. 27

Date of first examination 6.7.33.

Complaint. Cough on and off ever since birth.
It has been worse since scarlet
fever at 7 years old.

Previous history. Pneumonia at 1 year & 4 months
old. Measles at 2 years old.
Scarlet fever at 7 years old.

General appearance. She does not look very fit.
Her complexion is rather sallow and
her Mother says she is very irritable.

Examination.

Fauces & Nasopharynx.
Tonsillectomy about 5 years old.
Adenoids removed just recently.

Chest. There is some impairment of the
percussion note at the left base.
The breath sounds are harsh with
slight prolongation of expiration.
A few crepitations are heard at
the left base.

X-Ray. There is some patchy opacity at the
left base suggests consolidation and
perhaps some pleural thickening.

On 6.7.33. Bronchoscopy was performed under
general anaesthesia. Tenacious mucus was
aspirated from both main bronchi. Following
bronchoscopy the cough improved rapidly and
in August 1933 the chest had cleared completely.
She was examined a year later in August 1934.
She was then quite well and looked fitter. There
was no cough and no abnormal signs in the lungs.

No. 27.



An X-Ray taken in August 1934, after treatment, shows that the left base has cleared completely.

Donald Huntley. Age 3 years

No.28

Date of first examination 1.9.33.

Complaint. Cough for the past two years
without improvement.

Previous history. Measles at $1\frac{1}{2}$ years old.
Whooping cough at $2\frac{1}{2}$ years old.

General appearance. He is a healthy looking
child and well nourished.

Weight. 2st. 8.1bs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. The percussion note is good in all
areas. The breath sounds at the right
base are harsh in character. A few
rhonchi are heard.

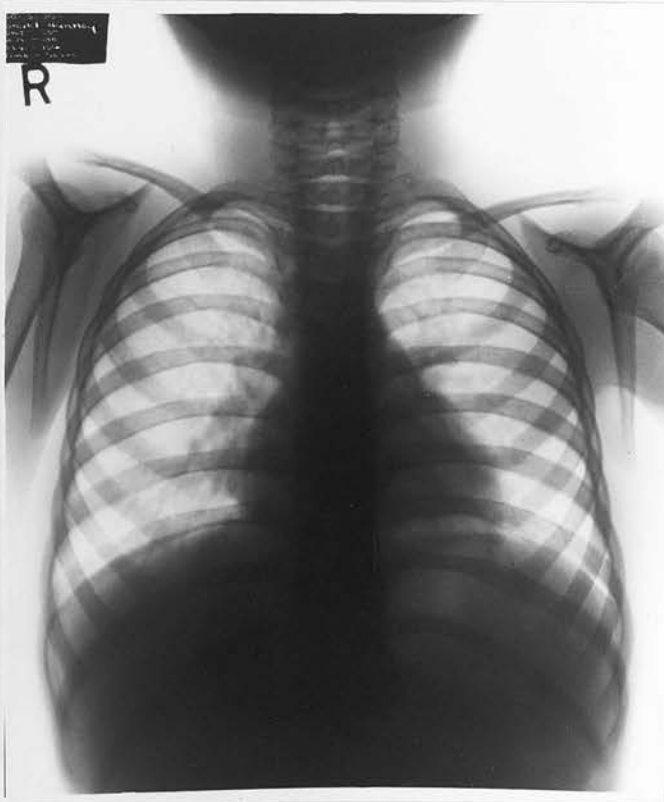
Mantoux reaction. Negative.

X-Ray. There is increased striation in the
left mid zone and some infiltration
of both lung fields.

On 16.9.33 Bronchoscopy was performed under general anaesthesia. Tenacious mucus was aspirated from the right main bronchus. The left main bronchus was clear. Bronchoscopy was repeated on 5.10.33 and tenacious mucus was aspirated from the right main bronchus. On 30.10.33 bronchoscopy was again carried out and some mucus was aspirated from the trachea, both main bronchi were clear and the mucous membrane was healthy in appearance. It was decided not to bronchoscope again unless further symptoms developed. He reported again in March 1935 with a return of the cough. The only physical signs made out in the chest were numerous rhonchi at the right base. An X-Ray taken in April showed the chest to be normal. Bronchoscopy was repeated on 11.4.35 and both main bronchi were found to be quite clear. The cough disappeared after this examination and the chest was quite clear when the child was examined on 11.5.35.



Increased striation left mid zone.



after treatment.
Appearances normal.

Kathleen Harford. Age 12 years.

No.29

Date of first examination 28.11.33.

Complaint. Cough for the past three years.

Previous history. She was an inpatient for 7 months in the Tuberculosis sanatorium but was discharged as non-tubercular two years ago. The Sanatorium report at that time was "probably old pneumonic condition but in view of poor general condition was regarded as a T.B.Minus case." Pneumonia three times at 18 months old, at 6 years old and at 11 years old. Tonsillectomy at 5½ years old.

General appearance. A healthy looking well developed child.

Weight. 5st. 3.lbs. 14ozs.

Examination.

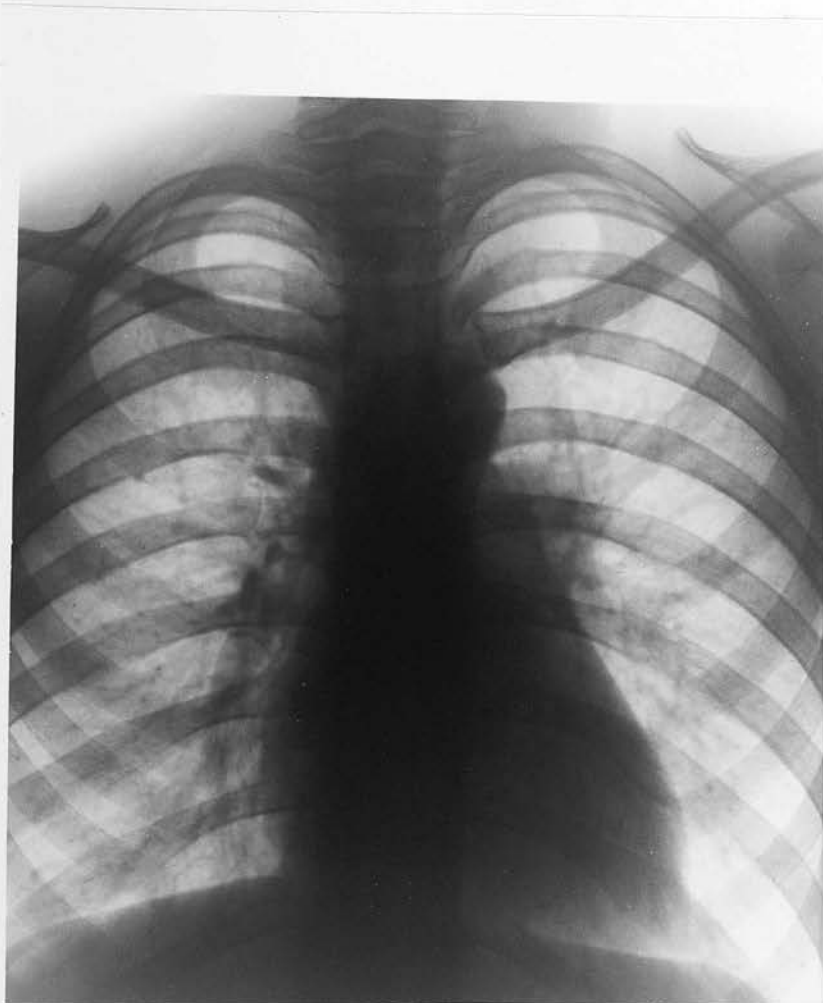
Fauces & Nasopharynx. Tonsils removed.

Chest. There is impairment of the percussion note in the left axilla. There are numerous crepitations in that area extending forward to the axillary fold just above and external to the nipple.

X-Ray. There is no definite X-Ray evidence of Tuberculosis, but there appears to be some increased striation at the left upper lobe and at the right base.

Medical treatment was persisted in until June 1934 without apparent benefit. On 21.6.34 Bronchoscopy was performed under general anaesthesia. A small quantity of mucus was aspirated from both main bronchi. The mucous membrane appeared healthy. When she was examined about a fortnight after bronchoscopy the cough had become a little less. The physical signs in the chest were practically the same as at the previous examinations although the crepitations were not so numerous. Although the mother was asked to bring her up for re-examination she has not done so.

No. 29.



Increased striation at the left upper lobe and
at the right base.

Frederick Thatcher. Age 5 years.

No. 30.

Date of first examination 10.5.34

Complaint. Cough for the past three years.

Previous history. Whooping cough when 2 years old
Bronchitis every winter since.

General appearance. He is rather a small boy for
his age, but he looks healthy.

Weight. 2st. 7.lbs. 10ozs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. There is a slight impairment of the
percussion note at the left base with
diminished air entry. There are
rhonchi all over both lungs.

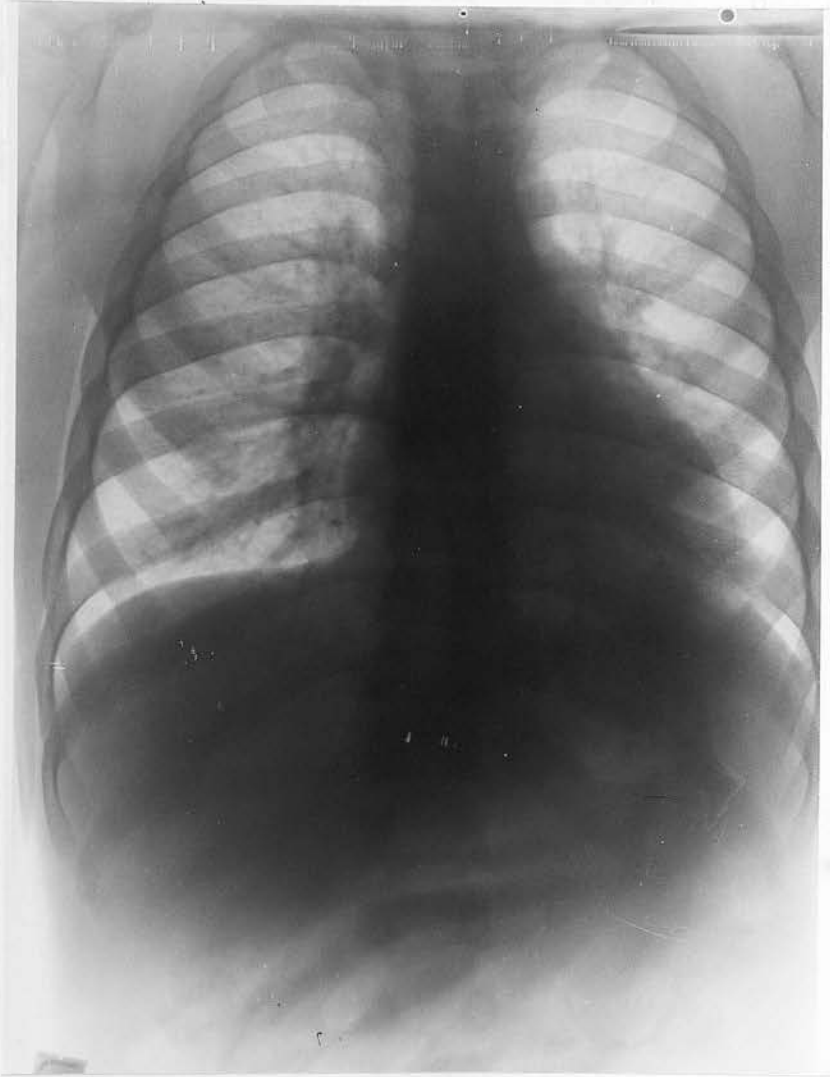
X-Ray. There is increased striation at both
bases but this more marked on the left
side.

On 5.7.34 Bronchoscopy was performed under
general anaesthesia. Mucopus was aspirated
from the trachea and right bronchus. The
appearance of the left main bronchus suggested
collapse of the left lower lobe. Blood and
pus were aspirated from the left lower lobe.
Gomenoleo 4 ccs. was injected. The cough
continued to be very troublesome and bronchoscopy
was repeated on 19.7.34. Mucopus was aspirated
from the trachea and there was some bleeding from
the right main bronchus. Gomenoleo was introduced.
The cough improved slightly but became worse again
in September. Bronchoscopy was repeated on 6.9.34
under general anaesthesia. Mucopus was again
aspirated from the right main bronchus and the
lower lobe bronchus appeared to be opening up.

Frederick Thatcher (continued)

The cough did not improve and bronchoscopy was again carried out on 18.10.34. A good deal of mucus was aspirated from both main bronchi. The physical signs in the chest remained the same so bronchoscopy was repeated on 8.11.34 under evipan anaesthesia. Mucus was present in the left main bronchus and this was aspirated. The cough improved for a time but became more troublesome again in February. Bronchoscopy was repeated on 7.3.35 under rectal paraldehyde and tenacious mucus was removed from the left main bronchus. The cough again improved until May 1935 when he developed Whooping cough.

No. 30.



Increased striation at both bases but more
marked at the left.

Jean Storey. Age 5 years.

No.31.

Date of first examination 29.5.34.

Complaint. Recurrent and persistent cough since a baby.

Previous history. No history of previous respiratory illness.

General appearance. Rather thin but otherwise healthy in appearance.

Weight. 2st. 2.1bs. 12ozs.

Examination.

Fauces & Nasopharynx. Tonsils slightly enlarged. No adenoids.

Chest. Slight impairment of percussion note at the right base. Breath sounds not distinct on account of numerous rhonchi all over both lungs. In addition crepitations were heard at both bases.

X-Ray. Some increased striation of both bases.

Bronchoscopy was first performed on 14.6.34 under general anaesthesia. Tenacious mucus was aspirated from both main bronchi. Bronchoscope was again passed on 12.7.34 and tenacious mucus aspirated from both main bronchi - greatest amount aspirated from left lower lobe bronchus. Tonsillectomy was done on 13.9.34. Bronchoscopy repeated on October 1934 and June 1935. When last seen 15.6.35 the child was not coughing so much and looking much better. The chest was quite clear, there was no dullness. The weight on that date was 2st. 7.1bs. 4ozs.

No. 31.



Increased striation at both bases.

Doris Wainman. Age 9 years.

No. 32

Date of first examination 20.6.34.

Complaint. Persistent cough for the past five years.

Previous history. Whooping cough at 4 years old. Measles at 7 years old. She had been attending the Tuberculosis Dispensary as she was a contact with a case of pulmonary tuberculosis in an adult. She was discharged as non-tubercular.

General appearance. She is a tall girl for her age but rather thin.

Weight. 3st. 3.1bs. 10ozs.

Examination.

Fauces & Nasopharynx. Tonsils small - no evidence of adenoids.

Chest. The percussion note is good over both lungs. The breath sounds at the right base are diminished in intensity. There are no accompaniments.

X-Ray. There is some increased striation in the right lower lobe.

On 26.7.34 Bronchoscopy was performed under general anaesthesia. Some muco pus was aspirated from the right main bronchus. Following bronchoscopy the cough improved but the physical signs in the chest remained stationery.

No. 32.



Increased striation in the right lower lobe.

Betty Cusick. Age 5 years.

No. 33

Date of first examination 11.12.34

Complaint. Frequent attacks of bronchitis for 2 years. She gets tired easily.

Previous history. No illness of note.

General appearance. She is a well developed healthy looking child.

Weight. 3st. 8ozs.

Examination.

Fauces & Nasopharynx. Tonsils healthy - no adenoids.

Chest. The percussion note is impaired at the left base posteriorly and this impairment extends round into the axilla. The breath sounds are harsh with slight prolongation of the expiratory phase and numerous crepitations are heard in that area.

X-Ray. Slight mottling at the left base.

On 3.1.35 Bronchoscopy was performed under general anaesthesia. The right main bronchus was found to be quite clear and the mucosa normal in appearance. The left main bronchus and terminal bronchi showed signs of mucosal irritation. Following bronchoscopy the cough improved and in a fortnight the dullness and the adventitious sounds had disappeared from the left base. She has been examined at frequent intervals. Since January the symptoms have not recurred and the chest has remained clear. There has been a gain in weight of nearly five pounds.

No. 33.



Slight mottling at the left base.

Nora Key. Age 6½ years.

No. 34

Date of first examination 21.2.35

Complaint. Cough of 2 years' duration.

Previous history. Pleurisy and Pneumonia
two years ago.

General appearance. Well nourished child.

Weight. 2st. 9lbs. 4ozs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. Marked superficial veins over the
upper part of the front of the
chest. Percussion note normal
over both lungs. Numerous rhonchi
all over chest.

X-Ray. Increased striation behind the
heart shadow running down from
the right root.

Bronchoscopy was performed on 28.2.35 under
general anaesthesia, and showed both main
bronchi clear. Since the bronchoscopy the
cough has practically disappeared. On several
examinations since treatment no abnormal signs
have been detected in the chest.

No. 34.



Increased striation behind the heart shadow.

Kenneth Thirkettle. Age 9 years.

No. 35

Date of first examination 30.4.35.

Complaint. Persistent cough for several years, worse during the past month. Always tired. Losing weight.

Previous history. Measles at 1 year & 10 months.

General appearance. Healthy.

Weight. 3st. 13.1bs.

Examination.

Fauces & Nasopharynx. Tonsils not enlarged - no adenoids.

Chest. Dullness at the left base posteriorly. Breath sounds harsh with prolongation of expiration. A few crepitations on deep inspiration.

X-Ray. Shows patchy opacity at the left base.

Bronchoscopy was first performed 16.5.35 under evipan anaesthesia. Both main bronchi were clear. When examined again 16.6.35 there has been a slight gain in weight up to 4st. 11.1bs. 14ozs. The cough is still troublesome. The chest condition remains as when first seen.

No. 35.



Patchy opacity left base. ? Bronchiectasis.

Walter Hearfield. Age 8 years.

No.36

Date of first examination 19.8.33.

Complaint. Cough on and off ever since birth - worse each winter.

Previous history. This boy has been under observation at the Tuberculosis Dispensary for two years for loss of weight and was admitted to the Sanatorium for non-tubercular treatment. Was treated as an inpatient in Hospital for two months. During this time his chest cleared but relapsed a few days after discharge.

Whooping cough at 3 years.

Pneumonia at 4 years.

Measles at 5 years.

General appearance. The boy is well nourished and his general condition is good. He has a frequent short cough.

Weight. 3st. 4.lbs. 2ozs.

Examination.

Fauces & Nasopharynx. Tonsils are slightly enlarged but are not unhealthy. No evidence of adenoids.

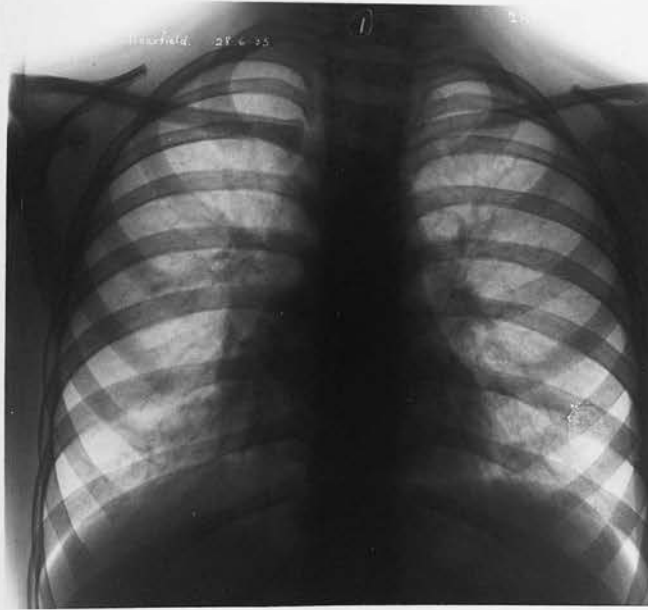
Chest. The chest expansion is good. The percussion note is good over both lungs. The breath sounds are harsh with slight prolongation of expiration over both lungs. Numerous moist rales are heard in all areas.

Mantoux reaction. Negative (19.8.33)

X-Ray. Appearance very suggestive of bronchiectasis of the right lung particularly the base. No X-Ray evidence of tuberculosis.

Bronchoscopy was performed 31.8.33 under general anaesthesia - thick yellow pus was aspirated from the right main bronchus. A

small amount was removed from the left main bronchus which was probably overflow from the right bronchus. After bronchoscopy the cough improved for about a week but returned again. Bronchoscopy was repeated on 16.9.33 and again a good deal of thick yellow pus was aspirated from the right main bronchus. Bronchoscopy with aspiration was carried out on 5.10.33., 19.10.33., 2.11.33. and 12.12.33. On each occasion yellow pus was aspirated from the right main bronchus but less in quantity each time. On 4.1.34 under general anaesthesia a bronchoscope was passed and both main bronchi were found to be clear. An x-ray taken in January 1934 showed that the appearance of the right base were practically normal. There was some slight pleural sclerosis - indicated by the fine linear shadow extending upwards and inwards from the inner part of the diaphragmatic shadow. This might be the shadow of the line of pleural reflection along the fissure of an accessory lobe at the right base. He was examined at intervals of a fortnight until July 1934 and the cough improved during this period and rhonchi were heard only occasionally. At the end of July the cough returned and bronchoscopy was carried out on 2.8.34 under evipan anaesthesia. A small amount of muco pus was aspirated from the right main bronchus and gomenoleo was introduced. He again improved and in November 1934 he had "Congestion of the Lungs" and was in bed for a fortnight. When examined after this illness there was a little impairment of the percussion note at the left base with harsh breath sounds. An x-ray showed practically the same appearance as in the previous x-ray. The cough improved and when he was examined in March he reported that there was no cough and that he was better as regards his general health. The chest was clear and there were no abnormal physical signs to be made out.



Bronchiectasis right base.



After treatment the appearance of the right base is practically normal.

Robert Gladstone. Age 11 years.

No. 37

Date of first examination. 1.1.35.

Complaint. Persistent cough for 6 years.

Previous history. Measles when 4 years old.
Tonsillectomy when 10 years old.

General appearance. Rather thin boy but
otherwise healthy in appearance.

Weight. 4st. 6.1bs.

Examination.

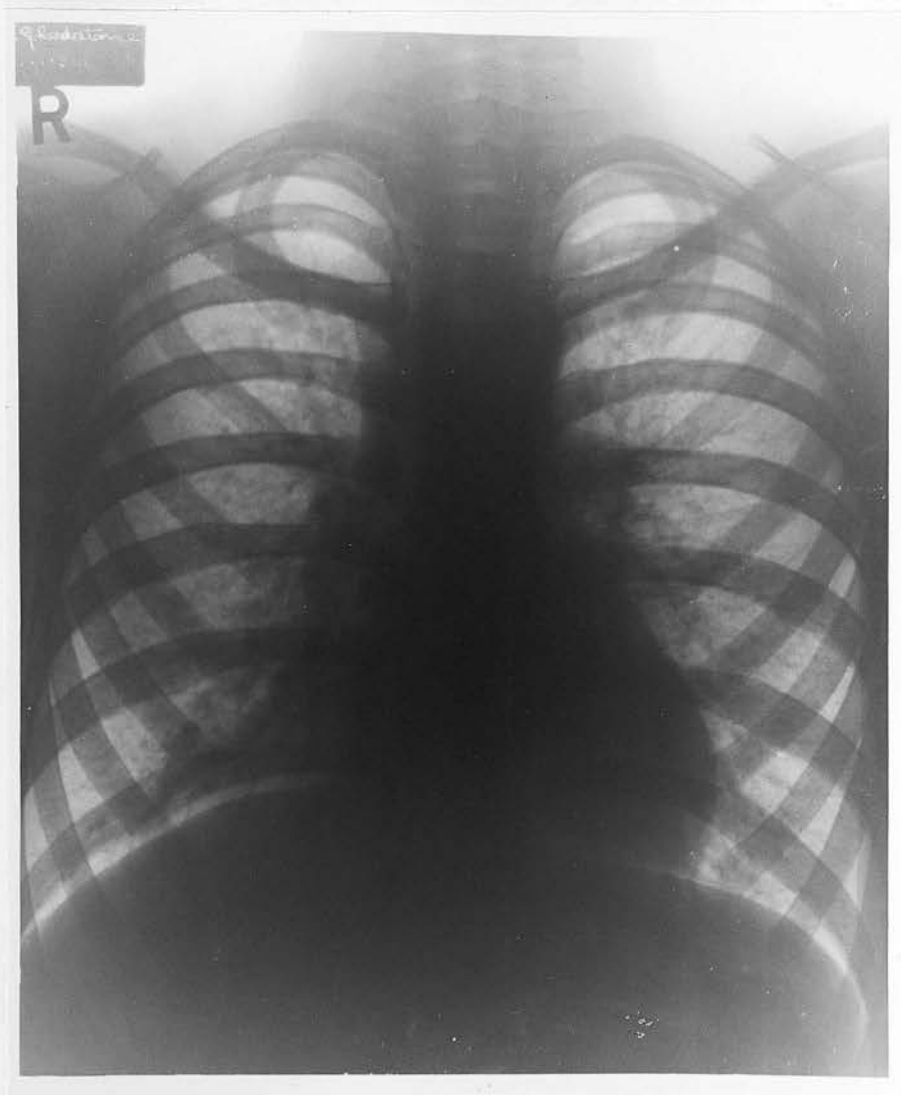
Fauces & Nasopharynx.
Tonsils and adenoids removed.

Chest. There was slight dullness on
percussion at the right base.
The breath sounds were harsh
with prolongation of expiration.
Numerous rhonchi were heard at
the right base.

X-Ray. The appearances suggest
bronchiectasis at the right base.

Bronchoscopy was carried out on 10.1.35 under
evipan anaesthesia and a small amount of mucus
was aspirated from the right main bronchus.
When seen a week after bronchoscopy the cough
had improved a little but the examination of
the chest showed no change in the physical
signs. He did not report again until June
1935 when the cough had greatly improved. The
breath sounds at the right base were still a
little harsh but there were no accompaniments.

No. 37.



Appearances suggest bronchiectasis at the right base.

Arnold Gill. Age $6\frac{1}{2}$ years.

No. 38

Date of first examination 23.3.35.

Complaint. Cough of one month's duration.

Previous history. Pneumonia (twice) last time when $4\frac{1}{2}$ years old.

Whooping cough when 3 yrs. old.

Measles when 3 years old.

Tonsillectomy when $5\frac{1}{2}$ yrs old.

Otitis Media (left) Feb. 1935.

Family history. Paternal Grandmother and Aunt died of Tuberculosis.

General appearance. A healthy looking child but rather thin.

Weight. 2st. 10.lbs. 10ozs.

Examination.

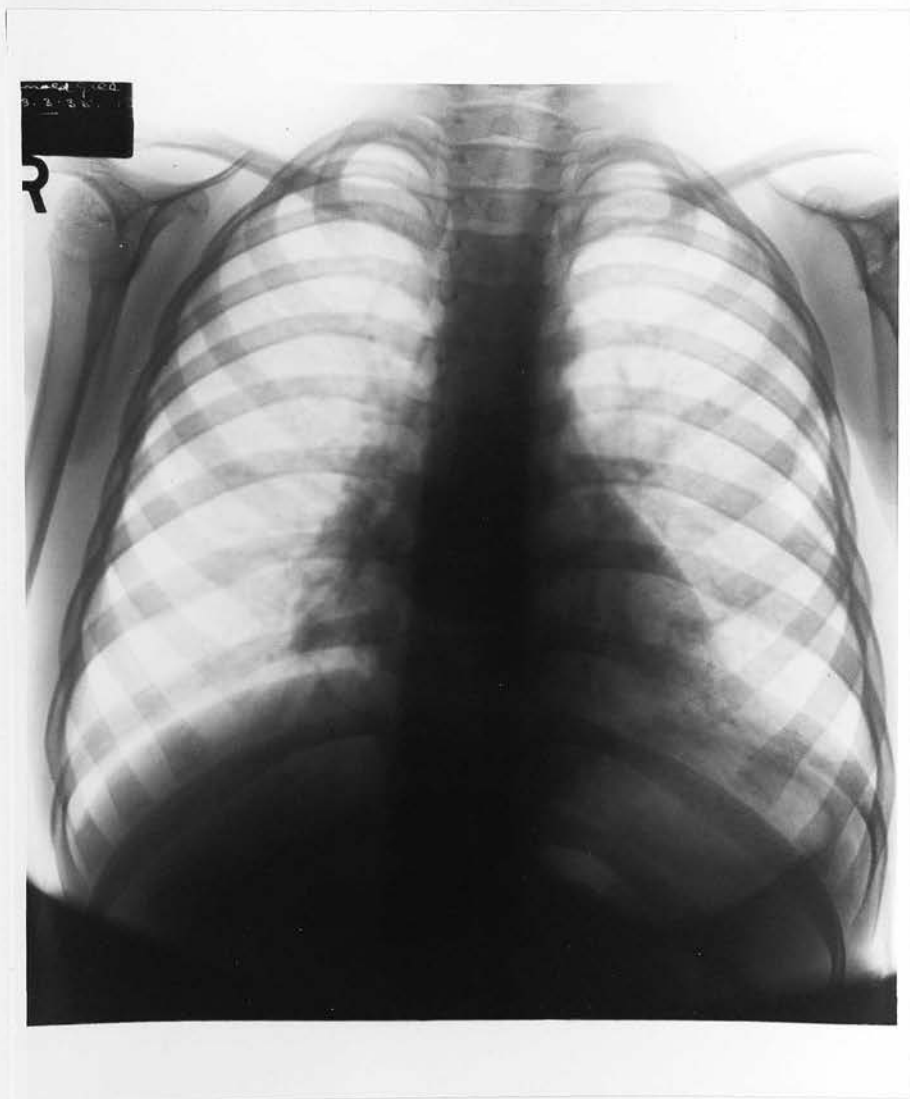
Fauces & Nasopharynx. Tonsils removed.

Chest. No dullness on percussion - breath sounds normal except at right base where they are high pitched in character - a few rhonchi and crepitations at the right base.

X-Ray. Appearance suggest the possibility of bronchiectasis at the right base.

Bronchoscopy was performed on 4.4.35 under evipan anaesthesia - muco pus was seen coming from posterior branch of the right lobe bronchus and this was aspirated. The cough improved for about a month but returned at the beginning of May and bronchoscopy was repeated on 16.5.35. Only a little muco pus was aspirated from the right lower lobe bronchus. The cough then improved and when he was examined on 1.6.35 there was no cough. The boy looked better and had gained a little weight. The breath sounds at right base were still high pitched but there were no accompaniments.

No. 39.



Appearances suggest bronchiectasis at the right base.

Herbert Lowery. Age 11 years.

No. 39

Date of first examination 26.2.35.

Complaint. Cough since early childhood.

Previous history. Whooping cough when 3 yrs old.
"Congestion of the lungs" when 9 yrs old.

General appearance. A healthy looking boy.

Weight. 4st. 12.lbs.

Examination.

Fauces & Nasopharynx. Nil.

Chest. Dullness on percussion over right root and impaired percussion note over right base. Air entry poor at right base. Rhonchi heard over right lower lobe.

X-Ray. The right root shadow is enlarged. Bronchiectasis right base.

Bronchoscopy was first performed 7.3.35 under evipan anaesthesia. Thick yellow pus was aspirated from the right main bronchus. 5 ccs. gomenoleo was introduced. Since bronchoscopy the cough has improved. On 15.6.35 the physical signs in the chest remained as before. There was a gain in weight up to 5st. 4.lbs. 8 ozs.

No. 39.



Increased right root shadow; bronchiectasis right
base.

Jack Purcell. Age 9 years.

No. 40.

Date of first examination 18.12.34

Complaint. Persistent cough since 6 years old.

Previous history. Pneumonia five times - last time at the age of 6.
Tonsillectomy at 7 years old.

General appearance. Rather pale anaemic boy with adenoid foci but he is not a mouth breather. No clubbing of the fingers.

Weight. 4st. 1.1b. 8ozs.

Examination.

Fauces & Nasopharynx. Tonsils removed - no adenoids.

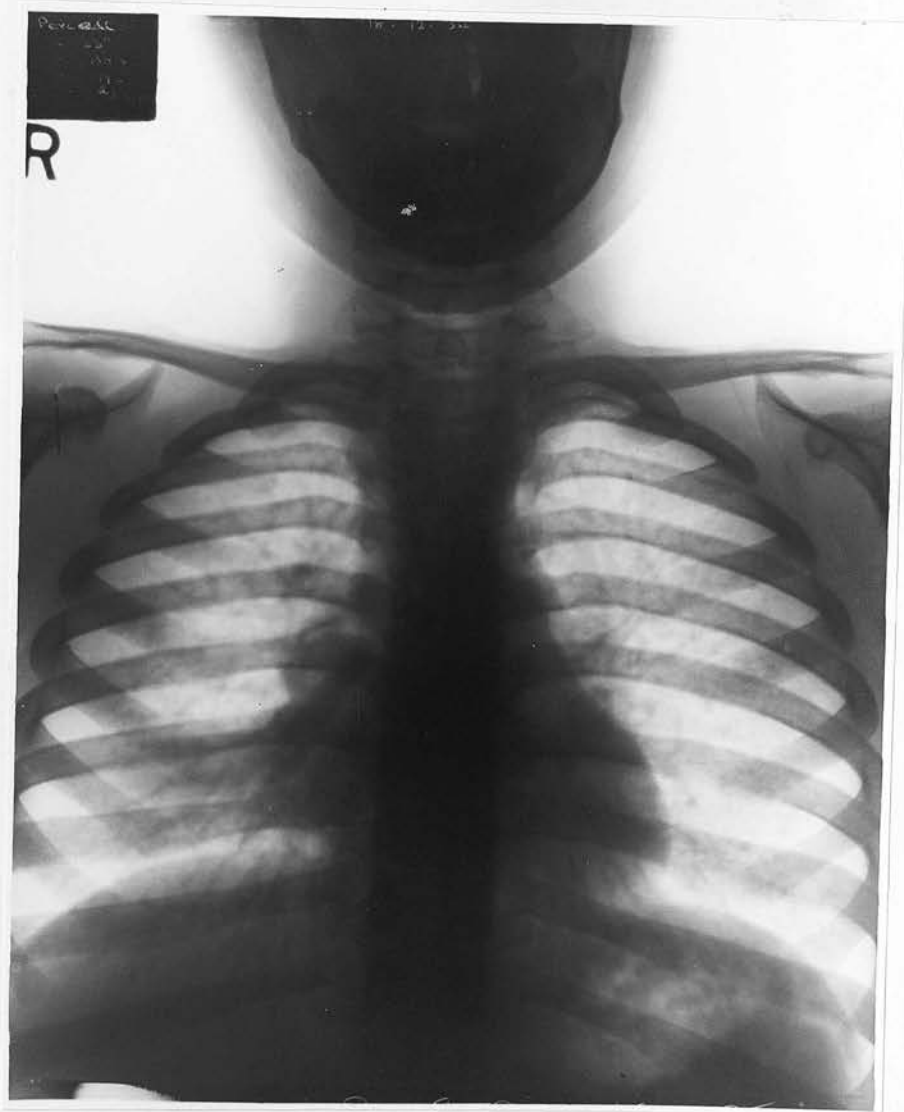
Antra. Transillumination shows no opacity.

Chest. Percussion note good all over both lungs. Numerous rhonchi heard in all areas.

X-Ray. Chest appearances suggest bronchiectasis at the right base. Nasal sinuses appear to be normal, there is possibly a slight opacity of the right antrum.

On 3.1.35 Bronchoscopy was performed under general anaesthesia. There was intense redness of the mucosa of the right main bronchus. No Mucopus was present. After bronchoscopy the cough improved a great deal. The physical signs in the chest improved and in June 1935 the only abnormality was that the breath sounds at the right base were not well heard. The boy looked much better and there had been a gain of $4\frac{1}{2}$ pounds in weight.

No. 40.



Bronchiectasis right base.

Eric Fisher. Age 6 years.

No. 41.

Date of first examination 12.3.35

Complaint. Cough for the past three years.

Previous history. Whooping cough when 3 yrs. old.
Measles when 4 years old.

General appearance. Healthy looking child.

Weight. 2st. 8.1bs.

Examination.

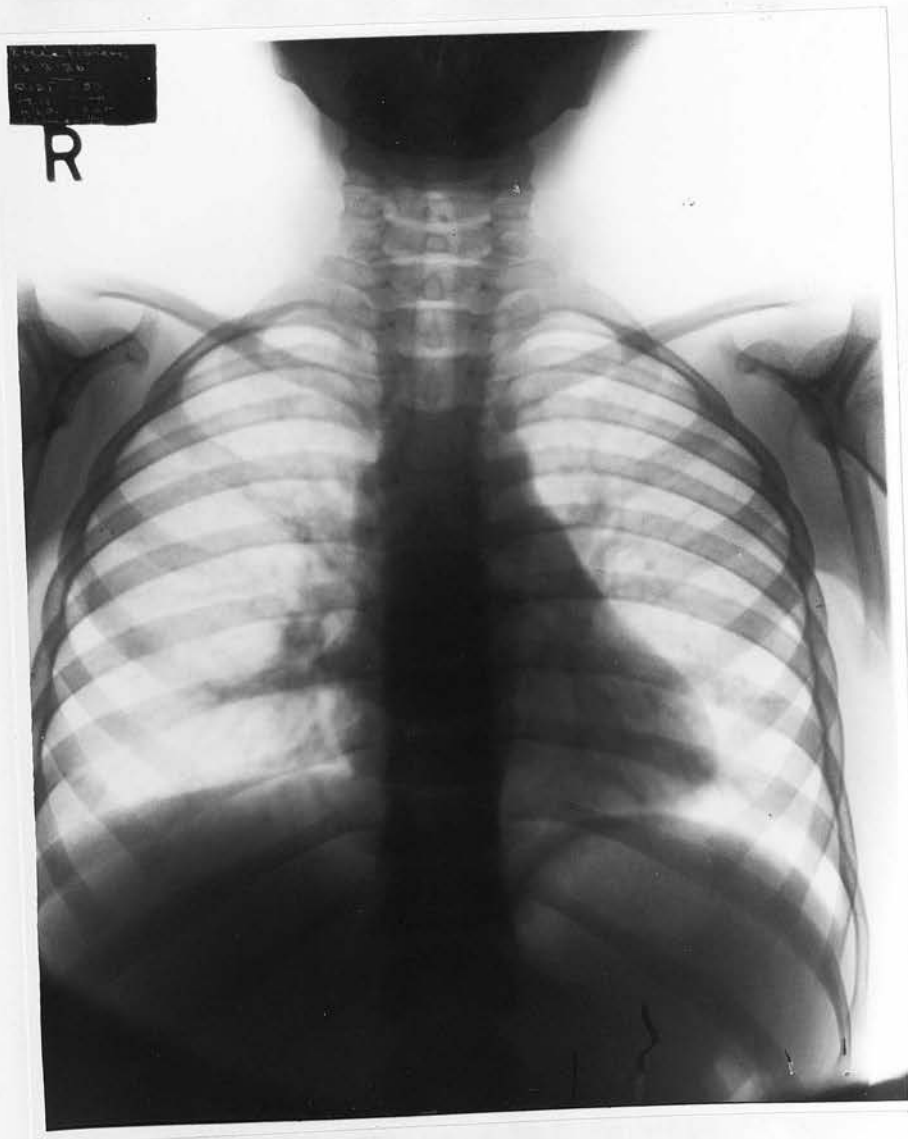
Fauces & Nasopharynx. Tonsils not enlarged.

Chest. Rather hyperresonant note all over
both lungs. Breath sounds normal.
Numerous rhonchi all over both lungs.

X-Ray. Bronchiectasis right base.

Bronchoscopy was first performed 28.3.35 under
evipan anaesthesia. Tenacious muco pus was
aspirated from both main bronchi. Bronchoscopy
was repeated on 18.4.35., Paraldehyde being
given per rectum. Some muco pus was aspirated
from the right main bronchus. 4 cc. gomenoleo
was injected. Following the second bronchoscopy
the cough was much improved.

No. 41.



Appearances suggest bronchiectasis at the right base.

Rhoda Dusher. Age 8 years.

No. 42.

Date of first examination. 14.3.34.

Complaint. Cough - of several years duration both summer and winter. This cough is worse at night.

Previous history. Pneumonia twice, at 5 years and 7 years.
Diphtheria with tracheotomy at 5 years.
Tonsillectomy at 4 years.
Measles at $3\frac{1}{2}$ years.

General appearance. The child is well developed for her age and looks well nourished. She has a somewhat sallow complexion but is not anaemic.

Examination.

Fauces & Nasopharynx. Tonsil beds are healthy and there are no adenoids.

Chest. There is impaired percussion note at the right base with high pitched breath sounds and some crepitations. The heart is not displaced and the sounds are normal.

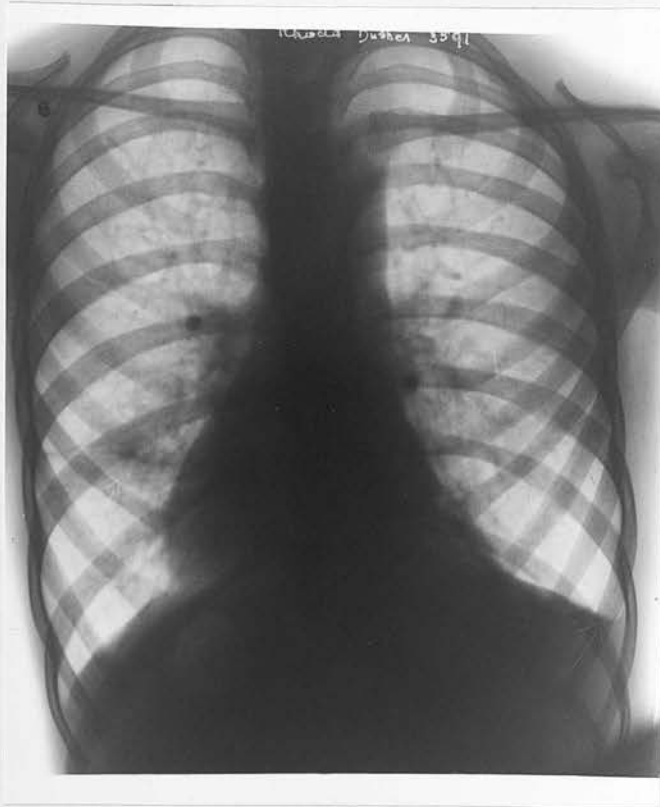
Mantoux reaction. Negative.

X-Ray. The appearances suggest that there is a small amount of fluid at the right base. The triangular opacity in the right cardio phrenic angle may be due to the presence of a collapsed bronchiectatic lobe. The appearance of the patch in the left fifth interspace is rather suggestive of tuberculosis but in view of the appearances at the right base should be interpreted with caution.

On 16.3.34 Bronchoscopy was performed under general anaesthesia. There was muco pus at the entrance of the posterior branch of the right inferior bronchus. Bronchoscopy was

Rhoda Dusher. (continued)

repeated on 12.4.34 and 3.5.34 under general anaesthesia. Some mucus was aspirated from the right main bronchus and gomenoleo was introduced. An x-ray taken at the end of April showed that the opacity at the right cardio phrenic sulcus had diminished in size. Bronchoscopy was repeated on 19.5.34 and 7.6.34 and some mucus was aspirated from the right main bronchus - though less than on previous occasions. An x-ray taken in July 1934 showed considerable improvement though the affected area could still be distinguished. The cough improved and the physical signs cleared up until the end of September when she was admitted to hospital with a temperature of 102° and complaining of pain in the right side of the chest. There was definite dullness at the right base with harsh breath sounds and numerous crepitations. The temperature came down to normal in two days and although the dullness persisted and the breath sounds remained harsh the crepitations became fewer. Bronchoscopy was repeated on 21.11.34 under evipan anaesthesia and mucus was aspirated from the right main bronchus and gomenoleo introduced. She was sent to a convalescent home on 16.2.35. On her return the examination of the chest showed the dullness to be present - the breath sounds still harsh, but crepitations only on deep inspiration. She did not return for examination until June 1935 and she reported that the cough was improved. The child looked better and her appetite was good. The physical signs at the right base remained unchanged.



Atelectatic bronchiectasis with a small amount of fluid at the right base.

Owing to error in printing this photograph has been transposed.



After treatment the opacity in the right phreno cardio sulcus has diminished in size.

Louisa Groom. Age 10 years.

No. 43

Date of first examination 2.4.35.

Complaint. Cough for the past 8 or 9 years.

Previous history. Pneumonia at 2 years and again at 3 years old. Was an inpatient in the Tuberculosis Sanatorium five years ago and discharged as non-tubercular.

General appearance. Healthy well-nourished child.

Weight. 3st. 12.1bs. 8ozs.

Examination.

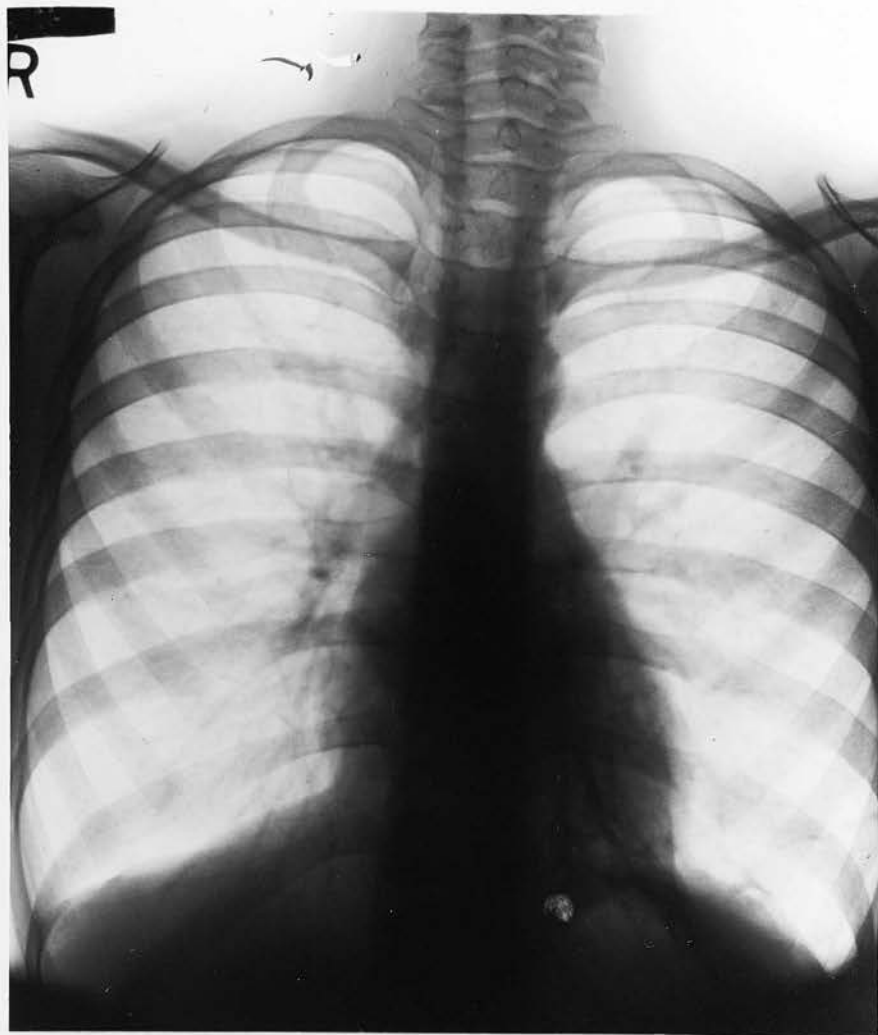
Fauces & Nasopharynx. Tonsils removed.

Chest. Dullness on percussion at the left base. Numerous crepitations at the left base.

X-Ray. Bronchiectasis left base.

Bronchoscopy was performed on 13.4.35 under evipan anaesthesia. Muco pus was aspirated from the left main bronchus. Was seen to be coming from the posterior branch of the lower lobe bronchus. Bronchoscopy was repeated on 23.5.35 under evipan anaesthesia. Muco pus was aspirated from the left lower lobe bronchus and 4 ccs. gomenoleo introduced. Since the treatment the cough has improved, the dullness at the left base remains stationary but the crepitations are not so numerous and are only heard on deep inspiration.

No.43.



Atelectatic bronchiectasis at the left base.

Joseph Greig. Age 6 years.

No. 44

Date of first examination 24.10.33.

Complaint. Severe winter cough for several years. Easily tired.

Previous history. Pneumonia when a baby.
Whooping cough 2 years old.

General appearance. He is quite a well developed boy, but his complexion is pale and sallow.

Weight. 2st. 8.lbs. 2ozs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. The percussion note is impaired at the left base posteriorly. The breath sounds in that area are harsh in character with prolongation of expiration. A few crepitations are heard.

X-Ray. X-Ray appearances suggest the possibility of collapsed bronchiectatic lobe at the left base.

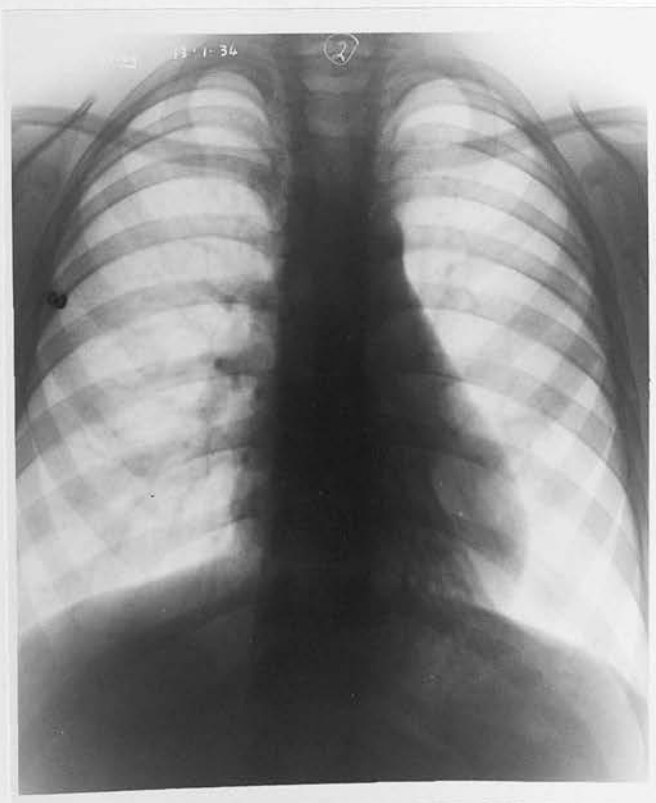
On 9.11.33 Bronchoscopy was performed under general anaesthesia. The right main bronchus showed some mucus pus which was aspirated easily and the mucous membrane appeared healthy. The left main bronchus was filled with tenacious mucus pus. When this was cleared the left lower lobe bronchus was found to be filled with tenacious pus. This pus was aspirated. The left lower lobe bronchus then appeared to be larger than normal. The cough improved a little following bronchoscopy but is still present in the morning. An X-Ray taken on 22.11.33 showed the same appearances as before. On 7.12.33 bronchoscopy was repeated and some tenacious mucus pus was aspirated from the left lower lobe bronchus but much less than at previous treatment.

Joseph Greig (continued)

The cough continued to improve and in January 1934, although the breath sounds still remained harsh, the crepitations had disappeared from the left base. An x-ray taken in January 1935 showed that the left lower lobe is still collapsed and the appearances suggest that there is now some fibrosis. In April there was a return of the moist sounds at the left base and bronchoscopy was repeated on 12.4.34, very little tenacious mucus was aspirated from the left lower lobe bronchus. He was examined at intervals of about three weeks and he reported that the cough had practically disappeared since May. An x-ray taken in November showed practically the same appearances as before. When he was examined in May 1935 the mother reported that he had no cough, that his appetite was better and did not tire easily. The dullness and harsh breath sounds were still present at the left base but there were no crepitations.



Atelectatic bronchiectasis at the left base.



After treatment the left lower lobe is still collapsed and the appearances suggest that there may be now some fibrosis.

Bartholomew Flintham. Age 5 years.

No. 45

Date of first examination 30.10.33.

Complaint. Cough for the past two years - worse during the last month. Easily tired.

Previous history. Broncho pneumonia at $2\frac{1}{2}$ years.
Measles at $3\frac{1}{2}$ years. He has not had whooping cough.

General appearance. This boy is rather undersized. His general condition is good.

Weight. 1st. 13.lbs. 12ozs.

Examination.

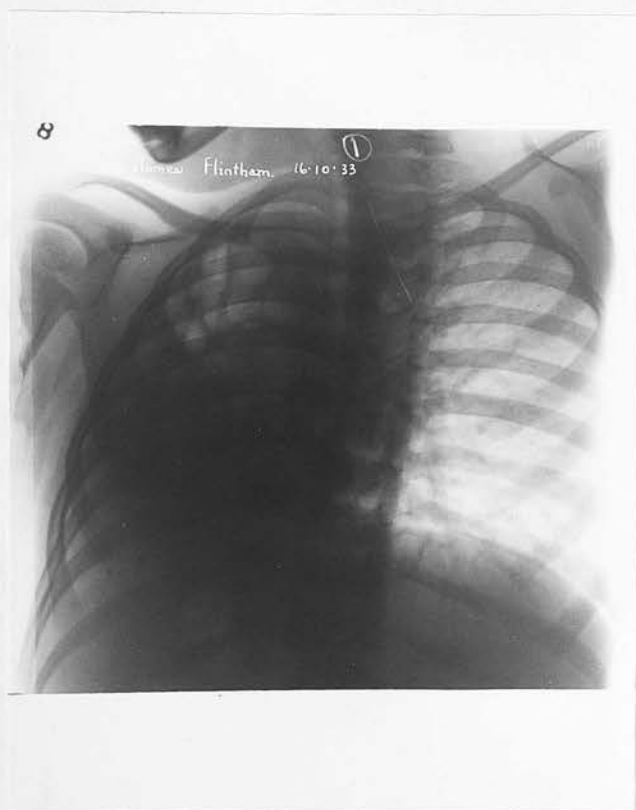
Fauces & Nasopharynx. Tonsils are small and quite healthy. No adenoids.

Chest. The chest is pigeon breasted. The expansion of the left lung is very poor. There is dullness over the whole of the left lung, with signs of cavity at the left apex. There are numerous crepitations all over the left lung. The apex beat is in the 4th interspace in the anterior axilliary line.

X-Ray. Old standing bronchiectasis. Cavitation left upper lobe, heart displaced to the left.

On 30.10.33 Bronchoscopy was performed under general anaesthesia. Thick pus was found pouring out of the trachea into the larynx. Examination of the bronchi was not carried out. The cough was much better for about four days after bronchoscopy but became very troublesome again. Bronchoscopy was repeated on 9.11.33 under general anaesthesia. Pus was aspirated from the larynx trachea and left main bronchus. Bronchoscopy was carried out on 22.11.33., 7.12.33., 21.12.33., and 4.1.34. On each occasion pus was aspirated from the trachea and the left main bronchus but on the last occasion there was very little pus in

trachea. An x-ray taken in January 1934 showed that the opacity of the left lung was not so marked as before. The cough became less troublesome, and the child looked rather better. In March 1934 he began to cough more, and on 15.3.34 bronchoscopy was again done. A good deal of pus was aspirated from the left main bronchus and gomenoleo was introduced. In order to keep the chest clear bronchoscopy was repeated on 12.4.34., 26.4.34., 14.6.34., 6.12.34., and 7.3.35. Each time pus was aspirated from the left main bronchus in considerable quantity. When he was examined in June 1935 the cough was still troublesome in the morning but the boy seemed fairly well - his appetite was good and he was quite energetic. The physical signs over the left lung remained as before but the crepitations were not so numerous.



Old standing bronchiectasis of the left lung. The heart is displaced to the left and there is cavitation in the left upper lobe. *Owing to error in printing this photograph has been transposed.*



After treatment the opacity of the left lung is not so marked as before.

Elsie Harrison. Age 10 years.

No. 46

Date of first examination 14.7.33.

Complaint. Cough which is worse in winter since pneumonia at 3 years old. She gets easily tired.

Previous history. Pneumonia at 3 years old. She has been in Tuberculosis Sanatorium five times but discharged as non-tubercular.

General appearance. Thin child with marked malar flush. She has a short frequent cough. There is marked clubbing of the fingers.

Weight. 4 stone.

Examination.

Fauces & Nasopharynx. Nothing abnormal.

Chest. The percussion note is impaired over the whole of the left lung. The breath sounds at the left apex and below the angle of the scapula posteriorly are tubular in character. The vocal resonance is decreased at the left base and increased at the left apex. Numerous rales and rhonchi are heard all over the left lung. The apex beat is in the fifth interspace $4\frac{1}{2}$ inches from the mid line. The heart sounds are normal.

Mantoux reaction. Negative. The sputum has been examined and found negative on numerous occasions while in the Sanatorium.

X-Ray. This shows partial collapse of the left lung with consolidation and cavity formation.

On 10.8.33 Bronchoscopy was performed under general anaesthesia. Thick tenacious pus was aspirated from the left main bronchus. This was repeated on 31.8.33 and practically no pus

Elsie Harrison (continued)

was aspirated from the left bronchus. The physical signs in the lungs a few days after bronchoscopy were those of a large empty cavity in the left lung. On 19.9.33 bronchoscopy was repeated as the cough had become more troublesome. A great deal of pus was aspirated from the left bronchus and Lipidol introduced through the bronchoscope. The x-ray shows an extensive bronchiectasis of the left lung especially of the upper and mid zones. The trachea is displaced to the left. Following the bronchoscopy the child improved a little and the cough became less troublesome. Bronchoscopy was again carried out on 2.11.33. Some muco pus was aspirated from the left main bronchus. This was repeated on 12.12.33 and thick pus was aspirated from the trachea and left main bronchus. Some overflow was aspirated from the right bronchus. This examination appeared to upset the child and she was feverish for several days after it. Bronchoscopy was again carried out on 7.3.34 as the cough became troublesome again and the crepitations in the left lung became more numerous. After the treatment the child was again feverish for several days, and the mother refused further treatment.

No. 46.



Old standing bronchiectasis with partial collapse of the left lung, consolidation and cavity formation.

Eric Skimm. Age 4 years.

No. 47

Date of first examination 14.10.33.

Complaint. Frequent winter cough for the past two winters. Worse during past two weeks.

Previous history. No illness of note.

General appearance. This boy is rather small for his age and poorly developed.

Weight. 2st. 8.1bs. 4ozs.

Examination.

Fauces & Nasopharynx. Tonsils unhealthy, Adenoids present.

Chest. Expansion of the chest is poor and the right side moves only very little. The percussion note is diminished over the whole of the right side. The breath sounds are diminished over the right base and there are numerous rhonchi over the whole of the right lung.

X-Ray. This shows partial consolidation of the lower lobe of the right lung.

Although there was the consolidation of the lower lobe of the right lung the child had no temperature and was able to be up. The abnormal physical signs continued in spite of medical treatment although the child improved in general health. An x-ray taken in November 1933 showed resolution of the right lower lobe. In December the dullness began to be less marked and by the end of the year had disappeared. The air entry at the right base also improved although numerous rhonchi were heard over the right lower lobe. It was decided to remove the tonsils and curette the adenoids, and this was done on 4.1.34. At the end of February the percussion note at the right base again became impaired and bronchoscopy was

Eric Skinn. (continued)

performed on 8.3.34. Clear watery pus was aspirated from the trachea - the left main bronchus was found to be clear. At the entrance to the right lower lobe bronchus bleeding granulations were seen and pus was aspirated from the bronchus beyond these. Gomenoleo was introduced. The cough improved slightly after bronchoscopy and this was repeated on 26.4.35. Pus was aspirated from the right main bronchus but the lower lobe bronchus appeared clearer. Gomenoleo was again introduced. After the treatment the cough improved and in May the dullness began again to diminish. When examined at the end of May the cough had improved a great deal, the boy was much fitter and the appetite better. The chest was found to be quite clear. At the end of June the cough began to be troublesome again and although there was no dullness numerous rhonchi were heard over the right lower lobe. Bronchoscopy was repeated on 21.6.34. Muco pus was aspirated from the right main bronchus - gomenoleo was introduced. Following this treatment the cough again cleared up, and the chest showed no abnormal physical signs. An x-ray taken in July 1934 showed that the consolidation had disappeared. In September 1934 he was examined again and found to be very much better as regards his general health. The cough had disappeared entirely and the chest showed no abnormal physical signs.

*Had the
Torr spec.
anything to
do with it?*



Partial consolidation of the lower lobe of the right lung.



After treatment considerable resolution.
(162)

Donald Harper. Age 5 years.

No. 48

Date of first examination. 3.7.34.

Complaint. Cough for past 2 yrs. Easily tired.

Previous history. Tonsillectomy at 2 years old.
Whooping cough at 3 years old.
Measles at 3 years old.

General appearance. A healthy looking fairly well developed boy.

Weight. 2st. 4.1bs. 8ozs.

Examination.

Fauces & Nasopharynx. Tonsils removed.

Chest. Dullness on percussion at the right base. Breath sounds diminished. No accompaniments.

X-Ray. Shows consolidation at the base of the right lung.

Mantoux reaction. Positive.

When he was first examined he was admitted as an inpatient on account of his having a temperature and because of the physical signs in the lungs. He ran an irregular temperature for 12 days after examination with an evening rise varying between 99° and 101° with a subnormal reading in the mornings. After the temperature returned to normal the dullness still remained but crepitations appeared and these physical signs persisted until 16.9.34 when bronchoscopy was carried out under general anaesthesia. Some muco pus was aspirated from the right main bronchus and in addition a small amount of blood. Following this he improved and began to gain weight. He was discharged from hospital on 16.9.34. When he was examined in November 1934

Donald Harper. (continued)

there was some return of the cough and the physical signs in the chest were practically the same as in August 1934. An x-ray taken at this time showed some mottling of the right lower lobe. The condition remained stationery until March 1935 and bronchoscopy was then decided upon. This was carried out on 14.3.35 under evipan anaesthesia and a little muco pus was aspirated from the left main bronchus while a larger amount was withdrawn from the right main bronchus. After this treatment the cough improved a great deal. He was re-examined on 11.5.35 and it was found that the dullness was becoming less - the breath sounds were rather high pitched but no accompaniments were heard. During the time he had been under treatment he gained 7,1bs and his general condition had improved and he did not tire so easily.



Bronchiectasis at the base of the right lung.



After treatment there is still some slight mottling at the right lower lobe.

Pauline Johnson. Age 6 years.

No. 49

Date of first examination 18.7.33.

Complaint. Frequent attacks of "chest trouble" for 5½ years. She gets easily tired on exertion.

Previous history. Pneumonia at 7 months old. Measles.

General appearance. Well nourished child - healthy appearance but with a marked malar flush.

Weight. 2st. 8.lbs. 8ozs.

Examination.

Fauces & Nasopharynx. Tonsils small - no adenoids.

Chest. The percussion note is impaired at the right base. The breath sounds are diminished in that area and there are numerous rales over the whole of the right lung but more in the lower lobe. The heart is not enlarged and the sounds are all closed.

Sputum. Negative for tubercle bacilli (three examinations)

Mantoux reaction. Positive.

X-Ray. Shows collapse of the lower lobe of the right lung.

Bronchoscopy was carried out under general anaesthesia on 3.8.33. The right lower lobe bronchus was found to be collapsed. Bronchoscopy was repeated on 10.8.33. and some muco pus was aspirated from the right lower lobe bronchus and some bleeding granulations were observed. The cough improved following the treatment and the physical signs cleared up somewhat, except that the air entry at the right base remained poor.

Pauline Johnson (continued)

An x-ray taken in February 1934 showed the condition much improved apart from a band of sclerosed pleura in the mid zone of the right lung with peaking of the pericardium where the shadow joins the mediastinum - probably due to pleuro-pericardial adhesions. In March the cough returned and a few crepitations were heard at the right base. Bronchoscopy was repeated on 15.3.34. Only a little muco pus was aspirated from the right main bronchus and 5 ccs. gomenoleo were introduced. At the end of April she had some dyspnoea and wheezing, but no cough. Bronchoscopy was again carried out on 10.5.34. Thin muco pus was found filling the right main bronchus. After aspiration this was seen to be coming from the terminal bronchi. This treatment was repeated on 7.6.34., and muco pus was again aspirated from the right main bronchus, and gomenoleo again introduced. She was examined at intervals until June 1935. During this period she remained well and had very little cough. The breath sounds at the right base remain diminished but there is no dullness on percussion. There has been a gain in weight of 5.1bs 10ozs. and she has been able to attend school regularly.



Collapse of the lower lobe of the right lung.



After treatment right lower lobe has expanded.

Sheila Dennison. Age 5 years.

No. 50.

Date of first examination 21.3.32.

Complaint. Cough following tonsillectomy.

Previous history. Tonsillectomy 1st March 1932.
Returned three weeks later complaining
of cough and evening temperature.

General appearance. She is a healthy and well
nourished child.

Weight. 2st. 12.1bs.

Examination.

Fauces & Nasopharynx. Tonsil fossae clean.

Chest. Dullness on percussion in the right
axilla and the right base. Breath
sounds distant with diminished air
entry. No accompaniments.

X-Ray. The appearance at the right base in
conjunction with the history suggest
lung suppuration.

On 21.3.32 Bronchoscopy was performed under
general anaesthesia. A large amount of foul pus
was swabbed away from the right main bronchus.
Granulations were seen shutting off the abscess
cavity. The abscess was opened up and large
quantities of foul pus were aspirated. On
24.3.32 bronchoscopy was repeated. The
bronchoscope was passed down the right main
bronchus and large quantities of pus were
recovered by suction. Bronchoscopy was repeated
four times at intervals of a week. On each
occasion pus was aspirated from the abscess
cavity though each time it was less in amount.
The dullness in the right axilla and at the
right base remained stationery but the breath
sounds became more distinct and tubular in
character. An x-ray taken on 6.5.32 showed
considerable resolution. On 10.5.32 bronchoscopy
was repeated. A small quantity of pus was
aspirated from the abscess cavity which appeared
much cleaner. The cough improved and the child

Sheila Dennison. (continued)

was sent to a convalescent home in June 1932. After her return she did not report for examination but in March 1933 returned complaining of cough but without sputum. The dullness remained as before - the breath sounds were tubular in character over the right lower lobe but there were no accompaniments. An x-ray taken on 14.3.33 showed some opacity of the right lower lobe. There was no further examination until August 1933 when the dullness was still present in the axilla. The x-ray taken on that occasion showed some opacity of the mid zone of the right lung the dullness at the right base having cleared.

In December 1933 she returned complaining of cough and the expectoration of yellow offensive sputum. An x-ray taken then showed bronchiectasis of the right middle and lower zones. Bronchoscopy was repeated on 14.12.33 when a considerable quantity of pus was aspirated from the abscess cavity. The dullness at the right base began to clear up and in May 1934 had disappeared though there was still some impairment of the percussion note in the right axilla. In November 1934 she again returned complaining of cough with some sputum following a febrile attack. There was dullness on percussion in the right axilla the breath sounds were high pitched in character and numerous crepitations were heard. The x-ray showed some fibrosis of the mid zone of the right lung. Bronchoscopy was performed on 29.11.34 under evipan anaesthesia and the cavity was found to be much smaller and no pus was aspirated. Since then the child has improved greatly - there is no cough and no expectoration. The appetite has improved and she looks fitter. The weight has begun to go up a little. The dullness on percussion in the axilla is still present and the breath sounds remain high pitched. There are no crepitations.

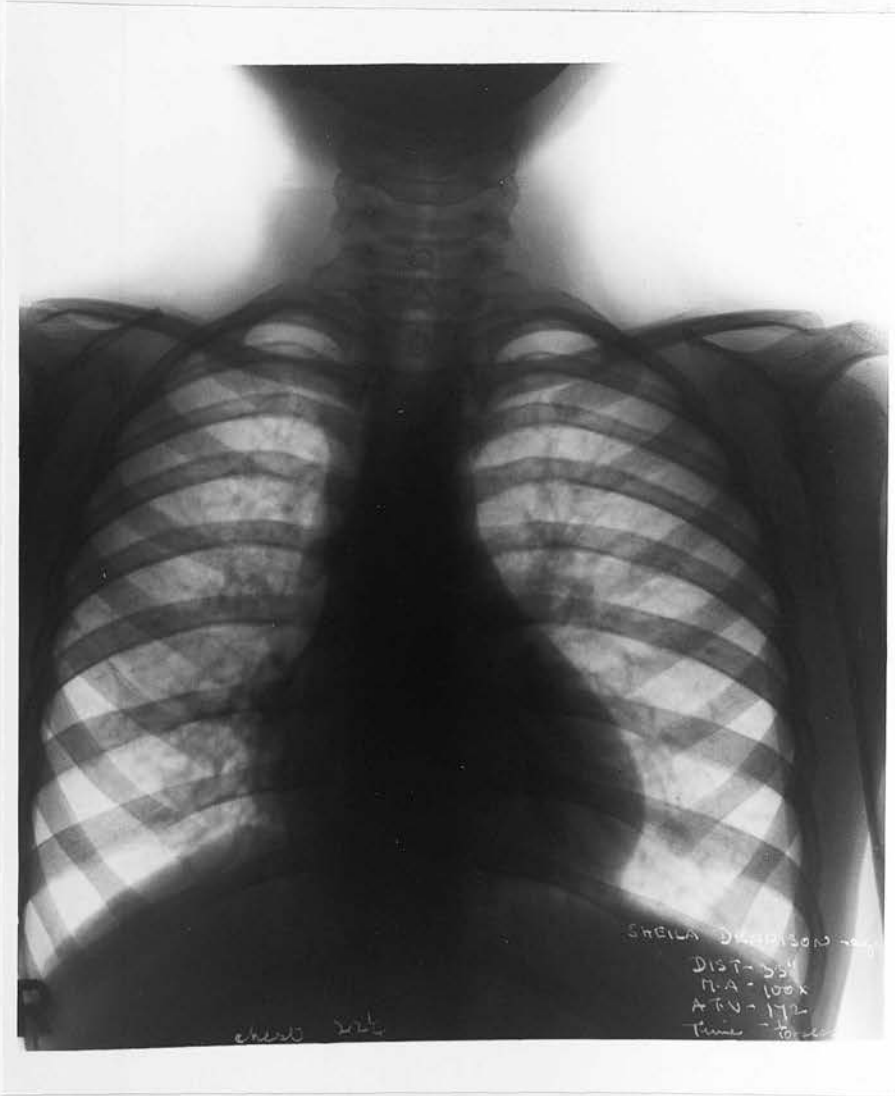


Lung abscess.



After treatment (x-ray Nov. 1932) the right base is clearer but there is still some opacity in the mid zone of the right lung.

No. 50.



(X-Ray Nov. 1934) there is still some fibrosis of the mid zone of the right lung.

GROUP C.

Cases of Asthma.

Nos. 51 - 60.

Eric Shepherdson. Age 6 years.

No.51

Date of first examination 11.10.33.

Complaint. Asthma since whooping cough at the age of six months.
Asthma every few weeks during the winter.

Previous history. Whooping cough at 6 months.

General appearance. The boy is well developed and his general physical condition is good.

Weight. 3st. 4.lbs. 10ozs.

Examination.

Fauces & Nasopharynx.

Tonsils slightly enlarged.
Adenoids present.

Chest. There is some impairment of the percussion note over the right root and a diminution of air entry at the right base. There are no accompaniments.

X-Ray. This shows bilateral increase in root density.

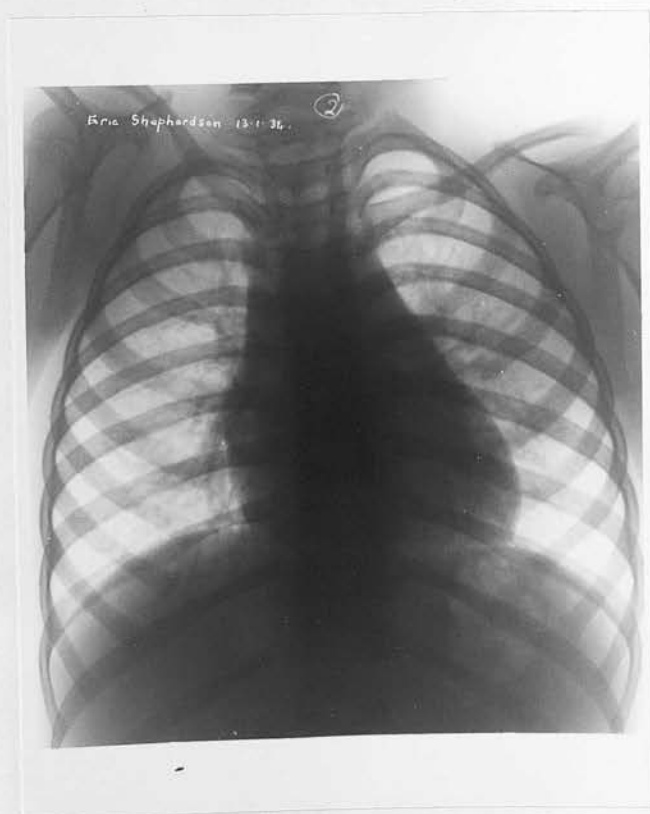
On 30.10.33 Bronchoscopy was performed under general anaesthesia. The whole mucous membrane of the trachea and bronchi was of a reddish colour and covered with a thin layer of mucus which was blown out during expiration. During the wheezing the trachealis muscle contracted. For the week following bronchoscopy he coughed a great deal and had a severe attack of asthma. Bronchoscopy was repeated on 7.12.33 under general anaesthesia. Mucus was aspirated from the trachea and none was found on the bronchi. Following this bronchoscopy the cough improved and the physical signs in his chest cleared up. An x-ray taken in January 1934 showed that the roots appeared more nearly normal. He was seen at intervals of about three weeks until June 1934 and had no asthmatic attacks. In that month he had one

Eric Shepherdson (continued)

attack of asthma and another slight one in August 1934. The chest remained clear during this period. When he was examined in February April and June 1935 he reported that he had had only one attack of asthma during this period. There was practically no cough. He was much better and the appetite was good, and he had gained 8 lbs. during the time he had been under examination.



Bilateral increase in root density.



After treatment (x-ray Jan. 1934) the roots now appear more nearly normal.

Kenneth Cline. Age 8 years.

No. 52

Date of first examination 10.7.34

Complaint. Asthma since 5 years old.

Previous history. Whooping cough and pleurisy
when 5 years old.
Measles when 6 years old.

General appearance. Healthy looking well
developed boy.

Weight. 4st. 2.lbs. 2ozs.

Examination.

Fauces & Nasopharynx. Tonsils have been
removed - no evidence of adenoids.

Chest. The expansion is good on both sides.
The percussion note is normal over
both lungs. Numerous rhonchi are
heard all over both lungs.

X-Ray. Accentuation of both root shadows.

On 19.7.34 Bronchoscopy was performed under general anaesthesia. The trachea was clear with a very well developed trachealis muscle. Both main bronchi were quite clear. 4 cc. gomenoleo was injected. After bronchoscopy he remained free from asthma for three weeks and bronchoscopy was repeated on 9.8.35 under sodium evipan. Tenacious muco pus was aspirated from the trachea and from the entrance to both main bronchi. He had no attacks of asthma until February 1935 when he had two, with an interval of a week between. He had another attack in March and one in June. When last seen in June he seemed much better - his appetite was good and he had gained $7\frac{1}{2}$ lbs in weight during the time he had been under treatment. The chest was quite clear.

No. 52.



Accentuation of both root shadows.

William Baines Age 12. years.

No. 53

Date of first examination 13.6.34

Complaint. Asthma for four years.

Previous history. Pneumonia when 2 years old.
Measles when 5 years old.

Family history. Father is asthmatic.
Baby brother has infantile
eczema.

General appearance. Well developed healthy boy.

Weight. 5st. 11.lbs. 14ozs.

Examination.

Fauces & Nasopharynx. Tonsils removed.

Chest. Percussion note good.
Rhonchi all over both lungs.

X-Ray. Striation right lower lobe
running down from right root.

Bronchoscopy was performed on 16.8.34 under general anaesthesia. A great deal of tenacious mucus was aspirated from the right main bronchus. He had a severe attack of asthma in September and bronchoscopy was repeated on 18.10.34 under evipan anaesthesia. Tenacious mucus was aspirated from the right main and lower lobe bronchi. After bronchoscopy he had no further asthma until the end of November when he had a very slight attack. Since then he has been seen at intervals of about a month and he has had no asthma. The chest has remained clear.

No. 53.



Striation right lower lobe running down from the
right root.

Olive Lamming. Age 10 years.

No. 54

Date of first examination 4.9.34.

Complaint. Asthma and chronic bronchitis
since the age of 2 months.

Previous history.

Whooping cough when 4 yrs old.
Pneumonia twice - once during
the course of whooping cough,
again at 6 years old.
Measles when 5 years old.

General appearance. Rather pale well-developed
child, with very dry and scaly skin.

Weight. 3st. 10.lbs. 6ozs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. Barrel shaped. Percussion note
hyper-resonant. Breath sounds normal.
Numerous rhonchi all over both lungs.

X-Ray. Increased striation at both roots
and both bases.

On 13.12.34 Bronchoscopy was performed under
general anaesthesia. Tenacious muco pus was
aspirated from right main bronchus.
Bronchoscopy was repeated on 10.1.35 under
general anaesthesia and small tough mucoid
plugs were seen in both main bronchi. Following
bronchoscopy the asthmatic attacks became less
frequent though the cough has still been
troublesome. When last examined - on 22.6.35
she had only had one attack of asthma since
February of this year. The physical signs in
the chest varied a good deal - on some occasions
the chest was clear, and on others it was full
of rhonchi.

No. 54.



Increased striation at both roots and both bases.

Victor Crowther. Age 11 years.

No. 55

Date of first examination 18.9.34.

Complaint. Persistent cough and asthma for
4½ years.

Previous history. Whooping cough and measles
when a baby.
Asthma commenced at 7 years
old.

Family history. The mother is asthmatic.

General appearance. He is a healthy well-
developed boy.

Weight. 4st. 7.1bs.

Examination.

Fauces & Nasopharynx. Tonsils small -
no adenoids.

Chest. The percussion note is somewhat
hyper-resonant over both lungs. The
air entry at the right base is poor.
A few rhonchi were heard in both lungs.

X-Ray. Some increase in striation at the
right root and right base.

Bronchoscopy was performed on 29.11.34 under
evipan anaesthesia and tenacious mucus was
aspirated from both main bronchi. He had no
further return of asthma until January 1935
when he had one mild attack. He did not return
for re-examination until June 1935 when his
mother reported that he was much better - only
having had one attack of asthma since January.
His cough had practically gone and there was a
gain of weight of 5 lbs. The examination of
the chest showed that the air entry at the
right base was still poor but no accompaniments
were heard.

No. 55.



Increase in striation at the right root and right base.

Peter Dibnah. Age 5 years.

No. 56

Date of first examination 23.10.34

Complaint. Asthma since 9 months old. The attacks recur about every fortnight and last about two days with cough and dyspnoea.

Previous history. No illness of note.

General appearance. He is a healthy looking child and is well developed. There is no clubbing of the fingers.

Weight. 2st. 12.1bs 8ozs.

Examination.

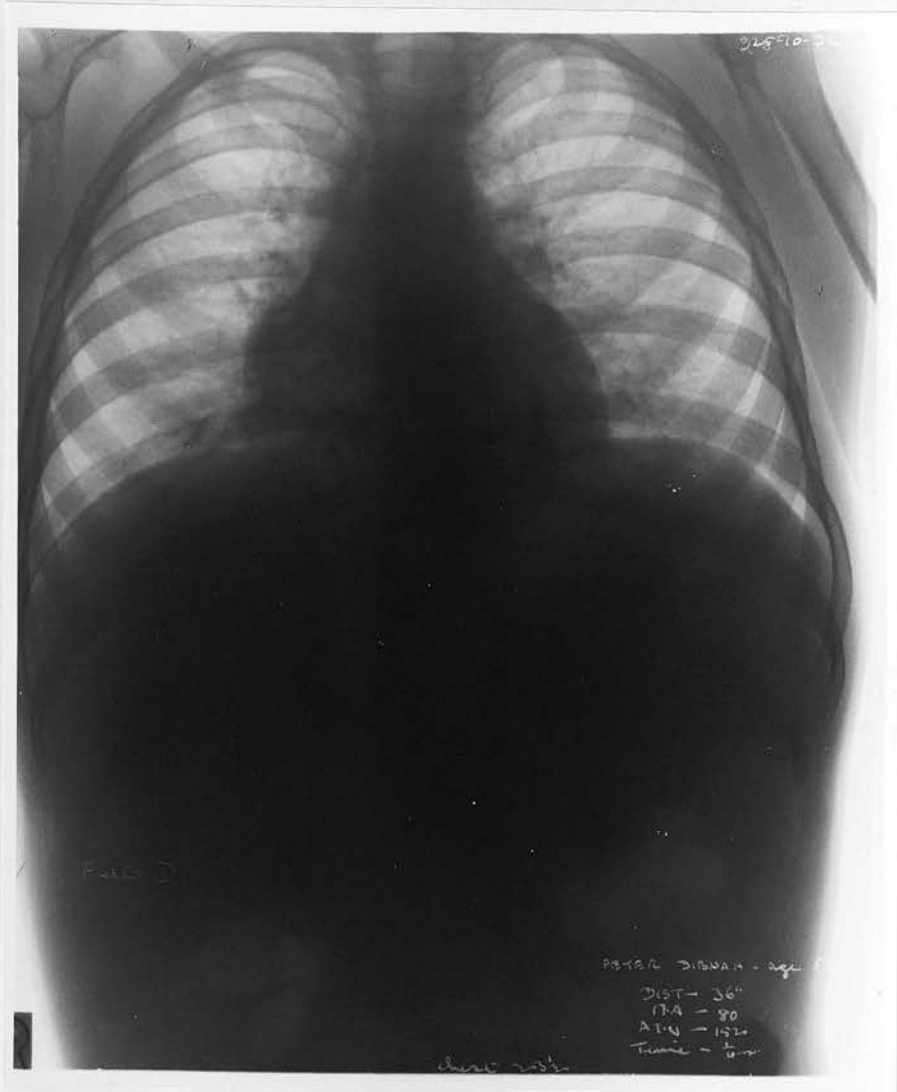
Fauces & Nasopharynx. Tonsils small and quite healthy. No adenoids.

Chest. The percussion note is good all over the chest. The breath sounds are normal but numerous rhonchi are heard all over both lungs.

X-Ray. The appearances suggest the possible presence of bronchiectasis at the right base.

On 1.11.34 Bronchoscopy was performed under general anaesthesia. A little tenacious mucus was aspirated from both main bronchi. 5 cc. gomenoleo was injected. After bronchoscopy there was no return of the asthmatic attacks but in December 1934 he developed measles and during this illness the cough was very severe. When he reported in the middle of January 1935 he stated that he had had two attacks of asthma but not severe ones and they only lasted a few hours. He had another attack of asthma at the beginning of February and bronchoscopy was repeated on 7.2.35 under evipan anaesthesia. The bronchi were found to be quite clear and gomenoleo was introduced. When examined in April he had had no return of asthma and there was practically no cough. Only a few rhonchi were heard in the chest. He was seen again in May and it was found that he had commenced with whooping cough.

No. 56.



Appearances suggest the presence of bronchiectasis at the right base.

Irene Tucker. Age 5 years.

No. 57

Date of first examination 3.1.35.

Complaint. Cough for several months - asthma -

Previous history. Whooping cough at 10 mths old.
Measles 2 years old.

General appearance. Healthy.

Weight. 2st. 7.1bs.

Examination.

Fauces & Nasopharynx. Tonsils small.

Chest. No dullness. Breath sounds at the right base high pitched in character. A few rhonchi heard at right base.

X-Ray. Accessory lobe at the right base.

Bronchoscopy was attempted on 11.4.35 under evipan anaesthesia but on account of respiratory collapse on the introduction of the laryngoscope it was not proceeded with. Bronchoscopy was performed on 6.6.35 under general anaesthesia. Some tenacious mucopus was aspirated from the right main bronchus. The bronchus to the accessory lobe was seen to be continuing beyond the normal limit of the lower lobe bronchus. Since the bronchoscopy the child has had less cough and has had no attacks of asthma.

Gordon Walker. Age 6 years.

No. 58

Date of first examination 26.2.35.

Complaint. Cough - Asthma and bronchitis since one year old. Worse during the past six months.

Previous history. Tonsillectomy at 4 years old. Measles with bronchitis six month's ago.

General appearance. A healthy looking, fairly well developed boy.

Weight. 3st. 3.lbs. 3ozs.

Examination.

Fauces & Nasopharynx. Tonsils small - no adenoids.

Chest. Slight dullness at the left base. Breath sounds harsh. Numerous crepitations at both bases.

X-Ray. Some increased striation at both bases.

Medical treatment was continued until the end of May with very little improvement. During the three months he had several attacks of asthma and had one period when he was indoors for a fortnight with bronchitis. On 23.5.35 bronchoscopy was performed under evipan anaesthesia - both main bronchi were clear and looked healthy. He was not re-examined until the end of June 1935 as he had developed whooping cough. At this examination it was found that he was still coughing a good deal but he had had no asthma since bronchoscopy.

No. 58.



Some increased striation at both bases.

Donald Hawkins. Age 3 years.

No. 59

Date of first examination. 17.4.34.

Complaint. Cough since 13 months old and asthma. Mother says he is always tired and listless.

Previous history. Broncho pneumonia (verified by hospital record) at 18 months old. Croup occasionally since 13 mths old.

General appearance. He is a fairly well developed and well nourished child. He is pigeon chested.

Weight. 2st. 11.1bs. 4ozs.

Examination.

Fauces & Nasopharynx. Tonsils small - no evidence of adenoids.

Chest. There is an impairment of the percussion note over the right root posteriorly with poor air entry at the right base. No accompaniments are heard.

X-Ray. The X-Ray appearances of the chest are normal.

On 26.4.34. Bronchoscopy was performed under general anaesthesia. There was a lining of mucus in both main bronchi, rather more in the right. This was aspirated and 2 cc. Lipiodol was injected. Bronchoscopy was repeated on 17.5.34 and gomenoleo was introduced. The cough improved and there was no attack of asthma, until he was examined on 16.6.34. On that date the mother reported that the cough had returned and had been very troublesome but that he had no asthma. Bronchoscopy was repeated on 21.6.34. A thin layer of mucus was found at the entrance to the main bronchi. This was removed by suction. He remained free from cough and asthma until the end of August when he had a slight attack following a head cold. The examination of the chest revealed no dullness, - the breath sounds were normal and only a few rhonchi were heard.

William Joyce. Age 8 years.

No. 60.

Date of first examination 26.3.35.

Complaint. Asthma 4 years' duration.

Previous history. No illness of note.

General appearance. Well nourished boy but rather sallow complexion.

Weight. 2st. 13.1bs, 6ozs.

Examination.

Fauces & Nasopharynx.

Tonsillectomy 1 year ago.

Chest. Percussion note good. Breath sounds obscured by numerous rhonchi all over both lungs.

X-Ray. Appearance of the chest is normal.

Bronchoscopy was performed on 28.3.35 under evipan anaesthesia. Tenacious mucus was aspirated from the entrance of the left main bronchus and from the posterior division of the left lower lobe bronchus. Since the treatment the asthmatic attacks have recurred about one a week, while previously he had been having three attacks each week. When he was last examined on 15.6.35 he appeared much better. He had had only two attacks of asthma in the preceding three weeks.

TABLE.

Giving a summary of the conditions found in the cases investigated, and the results obtained by treatment.

<u>Group A.</u>	-	Cases	1 - 8
<u>Group B.1.</u>	-	Cases	9 - 16
<u>Group B.2.</u>	-	Cases	17 - 50
<u>Group C.</u>	-	Cases	51 - 60

Abbreviations used in the Table.

C.	Persistent cough
A.	Asthma
E.T.	Easily tired
P.	Pneumonia, number in brackets indicates number of times.
Wh.c.	Whooping cough
M.	Measles
S.	Sinusitis
T.	Tonsillectomy
Sc.F.	Scarlet Fever
Cr.	Croup
San.neg.	Inpatient in Sanatorium and discharged as non-tubercular.
B.A.	Number of bronchoscopies.
C. (final column)	Cured.
V.M.I.	Very much improved
I.	Improved
I.S.Q.	In statu quo

No.	Age.	Com.		Dur.	Ill.	Clinical Examination.	X-Ray.	Bronchoscopy	No. of B.A.	Comments after Treatment.		
		plaint.	Prev.							General Condition	Physical Signs	Result
1	7	C.	Sev. yrs.	M.		Left base - dullness and creps.	Chest normal, heart enlarged	Thin muco pus both main bronchi more from left	1	No change, cough less gain in wt.	Slightly improved	I.
2.	8	C.	4	P. M.		Rhonchi both lungs, creps left base	Nil.	Tenacious muco pus both main bronchi	5	Improved, cough less. gain in wt.	Disappeared	V.M.I
3.	5	C.E.T.	4 $\frac{3}{4}$	P. M.		Right base-dullness, poor air entry, numerous rhonchi	Nil.	Bronchi clear, appearances normal	2	Slightly improved, no cough. Sl. gain in wt.	No change	I.
4.	7	C.	4	Wh.c.M		Dullness right root	Nil.	Small amount of muco pus both main bronchi	1	Improved, cough less, gain in wt.	No change	V.M.I
5.	3	C.	1	P. T.		Right base-dullness, poor air entry, numerous rhonchi	Nil.	Tenacious muco pus right main bronchus	1	Improved, no cough Sl. gain in wt.	Slightly improved	V.M.I
6.	12	C.	2	P. M.		Left base - dullness, poor air entry	Nil.	Tenacious muco pus left main bronchus. Post. branch of lower lobe bronchus collapsed	2	Improved, very little cough. Gain in wt.	Slightly improved	V.M.I
7	5	C.	4 $\frac{1}{2}$	M.Wh.c.		Left base - dullness, breath sounds high pitched, a few creps.	Nil.	Small amount of muco pus both main bronchi	1	Improved, no cough Sl. gain in wt.	Cleared up	C.
8.	6	C.	2	P. M. Wh.c.		Creps. left base	Nil.	Muco pus coming from post. branch of left lower bronchus.	1	Improved, no cough Sl. gain in wt.	Disappeared	C.
9.	10	C.	7	P.(2) Wh.c. San.neg		Dullness right root and right base, air entry right base poor.	Old right diaphragmatic pleurisy and root fibrosis.	Profuse muco pus both main bronchi	6	Not improved, cough still present. Sl. gain in wt.	No change	I.S.Q
10.	7	C.	Sev. yrs.	P.(3) M.		Left base - dullness, poor air entry, few rhonchi.	Patch of consolidation left base	Tenacious muco pus both main bronchi	2	Slightly improved, cough less. Gain in wt.	No change	I.
11.	12	C.E.T.	7	P. M. Wh.c.T.		Left base - dullness, rhonchi and creps.	Both antra opaque, Bronchiectasis left base.	Pus both lower lobe bronchi	3	Much improved, no cough Sl. gain in wt.	Disappeared	C.
12.	5	C.	2	Wh.c. T. & S.		Rhonchi all over both lungs, creps. both bases	? Bronchiectasis left base.	Muco pus both main bronchi	2	Improved, no cough . Sl. gain in wt.	Disappeared	C.
13.	12	C.	Sev. yrs.	P(2) S.		Left base - dullness, high pitched breath sounds, numerous crepitations.	Atelectatic bronchiectasis left base	Tenacious muco pus left main bronchus	1	Improved, no cough. gain in wt.	Unchanged	I.
14.	8	C.	1.	Wh.c.		Left base - breath sounds harsh	Increased striation both bases	Bronchi clear	1	Improved, cough less. gain in wt.	Disappeared	V.M.I
15.	6	C.	9/12	M.		Both bases poor air entry rhonchi all over both lungs	Both antra opaque, chest nil	Tenacious muco pus both main bronchi	1	Improved, cough less. gain in wt.	Slightly improved	V.M.I
16.	5	C.	8/12	M.T.S.		Right base - poor air entry	Increased striation right base	Tenacious muco pus both main bronchi	1	Slightly improved, cough less. Sl. gain in wt.	Slightly improved	I.
17.	10	C.	3	P. M.		Right base - slight dullness, harsh breath sounds & creps.	Slight thickening both roots increased striation right base.	Muco pus right main bronchus	4	Improved, cough less gain in wt.	No change	I.
18	6	C.	1	P.E.M. T.		Dullness right root and right base, rhonchi both lungs.	Increase in root density both sides some mottling in left lung field.	Tenacious muco pus both main bronchi	6	Not improved, cough persisting . Wt. stat.	No change	I.S.Q

No.	Age	Com plaint	Prev. Dur. Ill.	Clinical Examination	X-Ray	Bronchoscopy	No. of B.A.	Comments after Treatment.			
								General Condition	Physical Signs	Result	
19	4	C.	Sev. yrs.	P.(2)	Left base-breath sounds harsh, rhonchi and creps.	Increased hilar striation	Both main bronchi clear	4	Improved, cough less, gain in wt.	Disappeared	V.M.I.
20	9	C.E.T.	4	P.(2)	Right base - dullness, harsh breath sounds.	Striation right base	No mucous pus, mucous membrane healthy	1	Not improved, cough less. gain in wt.	No change	I.S.Q.
21	5	C.	1	P.E.M. T.	Right base - dullness, diminished breath sounds, a few rhonchi	Increased hilar shadow to the right	Both main bronchi clear and healthy	1	Much improved, no cough gain in wt.	Improved	V.M.I.
22	8½	C.E.T.	2	P.(2) Wh.c.M.	Dullness right root and right base, poor air entry, and creps right base.	Increased root shadow right side, striation right lower lobe.	Tenacious mucous pus right main bronchus	2	Improved, no cough gain in wt.	Improved	V.M.I.
23	7½	C.	3	P.	Dullness left base, air entry poor both bases, numerous rhonchi	Increased root shadow right side, with striation both bases	Mucous pus right main bronchus	3	Slightly improved, no cough, gain in wt.	Improved	I.
24	6	C.E.T.	4	P.(3)M San.neg.	Dullness both roots, poor air entry right base.	Extension of right root shadow	Mucous pus right main bronchus	1	Improved, cough less. Wt. stat.	Slightly improved	V.M.I.
25	8	C.	9/12	Wh.c.	Dullness right root, poor air entry right base.	Increased striation right root and running down to right base.	Mucous pus both main bronchi	1	Improved, no cough gain in wt.	Cleared up	C.
26	6	C.	3	P. Wh.c.M.	Rhonchi all over both lungs	Striation left lung	Tenacious mucous pus both main bronchi	3	Improved, no cough gain in wt.	Cleared up	C.
27	8	C.	1	P.M.T. Sc.F.	Left base-dullness, harsh breath sounds, creps.	Patchy opacity left base	Tenacious mucous pus both main bronchi	1	Improved, no cough gain in wt.	Disappeared	C.
28	3	C.	2	P.M. Wh.c.	Right base - harsh breath sounds	Striation left mid zone	Tenacious mucous pus right main bronchus	4	Improved, no cough gain in wt.	Cleared up x-ray normal	C.
29	12	C.	3	P.(3)T San.neg	Left axilla - dullness and numerous creps.	Increased striation left upper lobe and right base.	Small amount of mucous pus both main bronchi	1	Stationery. gain in wt.	Unchanged	I.S.Q.
30	5	C.	3	Wh.c. Br.	Left base-dullness, poor air entry, rhonchi all over both lungs.	Striation left base	Mucous pus right main bronchus, collapse left lower lobe bronchus	6	Not improved, cough persistent, gain in wt.	Improving	I.S.Q.
31	5	C.	4½	Nil.	Dullness right base, creps both bases.	Increased striation both bases	Tenacious mucous pus both main bronchi	3	Improved, less cough gain in wt.	Disappeared	V.M.I.
32	9	C.	5	Wh.c.M. San.neg.	Poor air entry right base, no accompaniments.	Striation right lower lobe	Mucous pus right main bronchus	1	Slightly improved, less cough. Wt. stat.	No change	I.S.Q.
33	5	C.E.T.	2	Nil.	Left base - dullness, harsh breath sounds, numerous creps.	Mottling left base	Left main bronchus signs of mucosal irritation	1	Improved, no cough. gain in wt.	Cleared up	C.
34	6½	C.	2	P.	Rhonchi all over both lungs	Increased striation behind the heart shadow.	Bronchi clear	1	Improved, no cough. Sl. gain in wt.	Cleared up	C.
35	9	C.E.T.	Sev. yrs.	M.	Left base - dullness, harsh breath sounds and creps.	Patchy opacity left base	Bronchi clear	1	Not improved, cough persisting. Sl. gain in wt.	No change	I.S.Q.
36	8	C.	8	P. Wh.c. M. San.neg	Breath sounds harsh both lungs, numerous creps.	Bronchiectasis right base	Thick pus right main bronchus	8	Improved, no cough. gain in wt.	Cleared up x-ray normal	C.

No.	Age.	Com	Dur.	Prev.	Clinical Examination	X-Ray	Bronchoscopy	No. of B.A.	Comments after Treatment		
		plaint		Ills.					General Condition	Physical Signs	Result
37	11	C.	6	M. T.	Right base-dullness, harsh breath sounds, rhonchi	Bronchiectasis right base	Small amount muco pus right main bronchus.	1	Improved, cough less gain in wt.	Slightly improved	V.M.I.
38	6½	C.	1/12	P.(2) Wh.c. M.T.C.	Right base- breath sounds high pitched, rhonchi and creps	Bronchiectasis right base	Muco pus posterior branch of right lower lobe bronchus	2	Improved, no cough Sl.gain in wt.	Slightly improved	V.M.I.
39	11	C.	6	P. Wh.c.	Dullness right root and base, air entry poor right base, rhonchi	Increase of right root shadow Bronchiectasis right base	Thick yellow pus right main bronchus	1	Slightly improved, cough less. gain in wt.	No change	I.
40	9	C.	3	P.(5) T.	Numerous rhonchi all over both lungs	Bronchiectasis right base	Intense redness mucosa of right main bronchus, no muco pus	1	Improved, cough less, gain in wt.	Improved	V.M.I.
41	6	C.	3	Wh.c. M.	Rhonchi all over both lungs	Bronchiectasis right base	Tenacious muco pus right main bronchus.	2	Slightly improved, cough less, gain in wt.	No change	I. I.
42	8	C.	Sev. yrs.	P.(2) M. T.	Right base-dullness, breath sounds high pitched, creps.	Atelectatic bronchiectasis at right base.	Tenacious muco pus post. branch right lower lobe bronchus, bronchus beyond collapsed.	6	Slightly improved, cough less, gain in wt.	No change, x-ray slight improvement	
43	10	C.	8	P.(2) San.neg.	Left base-dullness, numerous creps.	Atelectatic bronchiectasis at left base.	Pus left main bronchus and coming from post.branch lower lobe bronchus	2	Improved, cough less, gain in wt.	Dullness still present, but creps only on deep inspiration	I.
44	6	C.E.T.	Sev. yrs.	P. Wh.c.	Left base-dullness, harsh breath sounds, creps.	Atelectatic bronchiectasis at left base.	Tenacious muco pus left main bronchus and left lower bronchus, lower lobe bronchus larger than normal.	3	Improved, no cough gain in wt.	Slightly improved	V.M.I.
45	5	C.E.T.	2	P. M.	Left lung-expansion poor, dullness all over cavity left apex, heart drawn across to left	Bronchiectasis left lung.	Thick pus larynx, trachea and left main bronchus.	11	General health slightly improved, cough persisting, gain in wt.	No change	I.S.Q.
46	10	C.	7	P. San.neg	Left lung-dullness all over tubular breathing left apex, rales and rhonchi.	Consolidation and cavity formation left lung.	Thick pus trachea and left main bronchus.	5	Not improved, cough persisting, Sl.gain in wt.	No change	I.S.Q.
47	4	C.	2	Nil.	Dullness right base, poor air entry right base, rhonchi all over right lung.	Consolidation right lower lobe	Bleeding granulations entrance to right main bronchus, pus in right lower lobe bronchus.	3	Improved, no cough, gain in wt.	Cleared up, x-ray consolidation disappeared	C.
48	5	C.E.T.	2	Wh.c. M. T.	Right base-dullness, diminished breath sounds, no accompaniments.	Consolidation right base	Some muco pus and a little blood right main bronchus	2	Improved, cough less, gain in wt.	Improved	V.M.I.
49	6	C.	5½	P. M.	Right lower lobe-dullness and creps.	Collapse right lower lobe	Right lower lobe bronchus collapsed, some muco pus right lower lobe bronchus, granulations at entrance.	6	Improved, very little cough attended school all winter. gain in wt.	Dullness disappears	C.
50	5	C.	3 wks	T.	Dullness right axilla and base, poor air entry	Lung abscess.	Foul pus right main bronchus, granulations shutting off abscess cavity - opened up - large quantity of foul pus.	9	Improved, no cough, gain in wt.	Dullness still present, breath sounds high pitched, no accompaniments.	C.
51	6	A.	5½	Wh. c.	Dullness right root, poor air entry right base.	Bilateral increase in root density.	Mucous membrane red in colour covered by thin layer of mucous.	2	Improved, asthma less frequent, gain in wt.	Cleared up	V.M.I.

Com					Prev.			Comments after treatment.			
No.	Age.	Com	plait Dur.	ILL.	Clinical Examination	X-Ray	Bronchoscopy	No. of B.A.	General Condition	Physical Signs	Result.
52	8	A.	3	Wh.c.	Rhonchi all over both lungs	Accentuation both root shadows.	Both main bronchi clear, well developed trachealis muscle	2	Improved, asthma much less frequent, gain in wt.	Variable	V.M.I.
53	12	A.	4	P. M.	Rhonchi all over both lungs	Striation right lower lobe	Tenacious muco pus right main bronchus	2	Improved, no asthma, gain in weight.	Cleared up	V.M.I.
54	10	A. & C.	9	P.(2) Wh.c. M.	Numerous rhonchi both lungs	Increased striation both roots and both bases.	Tenacious muco pus both main bronchi	2	Slightly improved, asthma less frequent, gain in wt.	No change	I.
55	11	A. & C.	4½	Wh.c. M.	Air entry poor right base, rhonchi both lungs.	Striation right root and right base	Tenacious muco pus both main bronchi	1	Improved, asthma less frequent, gain in wt.	Slightly improved.	V.M.I.
56	5	A.	4	Nil.	Numerous rhonchi all over both lungs.	? Bronchiectasis right base	Tenacious muco pus both main bronchi.	2	Improved, asthma less frequent, gain in wt.	Cleared up	V.M.I.
57	5	A. & C, Sev. Mths.		Wh.c. M.	Right base - high pitched breath sounds.	Accessory lobe right base	Muco pus right main bronchus, accessory lobe bronchus identified.	1	Improved, less cough, no asthma, gain in wt.	No change	V.M.I.
58	6	A. & C.	5	M. T.	Dullness left base, creps both bases.	Some increased striation both bases	Both main bronchi clear.	1	Slightly improved, no asthma, cough still present, Sl. gain in wt.	No change	I.
59	3	A. & C.	2	Cr.P.	Dullness right root, poor air entry right base.	Nil.	Muco pus both main bronchi, more from right.	3	Improved, asthma less frequent, gain in wt.	Cleared up	V.M.I.
60	8	A.	Sev. yrs.	Nil.	Rhonchi all over both lungs	Nil.	Tenacious muco pus left main bronchus and post. division of left main bronchus.	1	Improved, asthma less frequent, Sl. gain in wt.	Improved	V.M.I.